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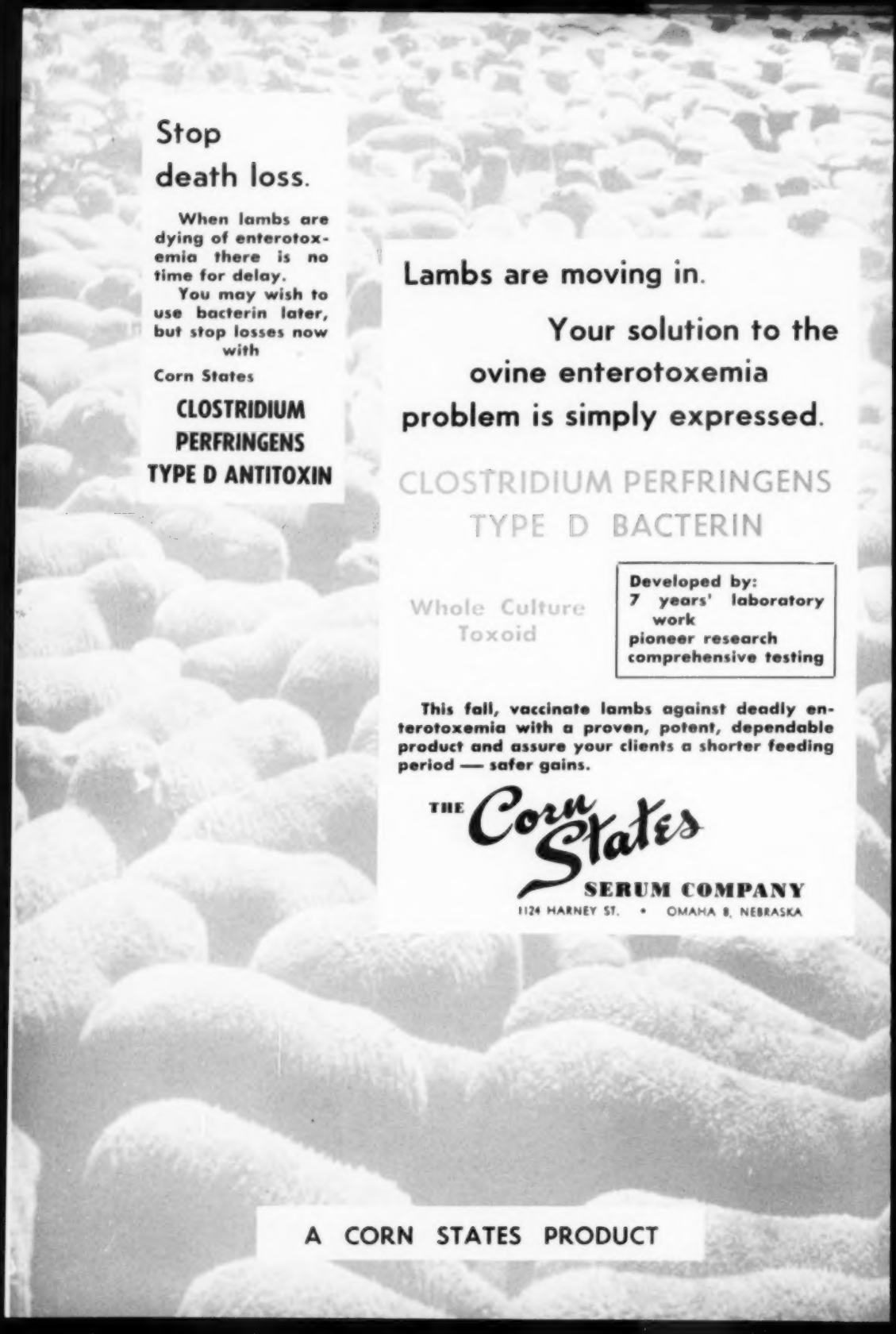
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

(Contents continued on adv. pages 2 and 4)

Volume 123 SEPTEMBER 1953 Number 918


Stop
death loss.
When lambs are dying of enterotoxemia there is no time for delay.
You may wish to use bacterin later, but stop losses now with
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Journal of the American Veterinary Medical Association

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CLINICAL DATA

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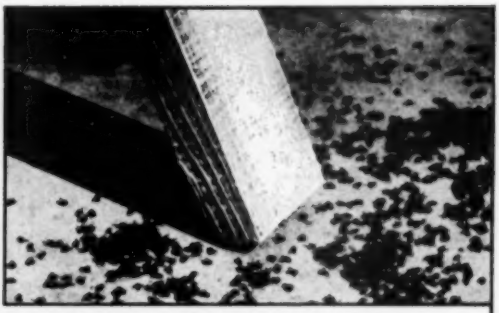

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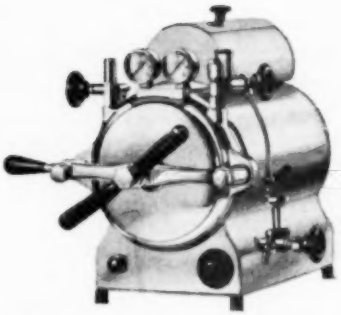

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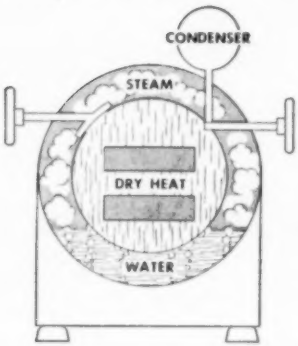

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AVMA ☆ Report

Veterinary Medical Activities

✦ Brig. Gen. James A. McCallam was installed as president of the AVMA at the Closing Session of the 90th Annual Meeting of the AVMA, held in Toronto, July 20-23, 1953.

★ ★ ★ ★

✦ Dr. A. H. Quin, Kansas City, Mo., was unanimously elected as president-elect of the AVMA at the Ninetieth Annual Meeting in Toronto, July 20-23, 1953. Details of the meeting will appear in the October JOURNAL.

★ ★ ★ ★

✦ The five AVMA vice-presidents unanimously elected at Toronto for the coming year are: Drs. J. Gordon Anderson, Calgary, Alberta; Peter G. MacKintosh, Yakima, Wash.; J. F. Shigley, State College, Pa.; John McAuliff, Cortland, N. Y., and J. B. Engle, Summit, N. J.

★ ★ ★ ★

✦ The Toronto meeting, July 20-23, 1953, set a new record for attendance when 3,501 registered. The previous record was set at Milwaukee in 1951, when 3,128 registered.

★ ★ ★ ★

✦ Dr. Edwin Laitinen, Hartford, Conn., was reëlected as chairman of the Executive Board.

★ ★ ★ ★

✦ Honored at the opening session in Toronto were: Dr. L. Van Es, Lincoln, Neb., who was awarded the Twelfth International Veterinary Congress Prize; Dr. George H. Hart, Davis, Calif., who received the annual Borden Award, presented by Mr. W. A. Wentworth of the Borden Company; and Dr. George W. Gillie, Fort Wayne, Ind., who was given the AVMA Award.

★ ★ ★ ★

✦ The 1953 AVMA Humane Act Award winner is Martin Nicholson of North Vancouver, B. C., who rescued a dog from a boiling rapids near his home.

★ ★ ★ ★

✦ The N. B. C. radio broadcast, highlighting news from the convention, featured President J. A. McCallam, Dr. John A. Charlton, president of the Canadian V.M.A., and member of Parliament, Dr. T. Lloyd Jones, president of the Ontario V.M.A. and principal of the Ontario Veterinary College, and Dr. W. A. Aitken, Chicago, editor of the AVMA JOURNALS.

★ ★ ★ ★

✦ Executive Secretary J. G. Hardenbergh and Mrs. Hardenbergh sailed on the Empress of France from Montreal on July 24 with other members of the delegation to the International Veterinary Conference at Stockholm, Sweden, August 9-15. They landed at Liverpool and planned to visit the British Isles and, later, several European countries. They expect to be home about September 10.

★ ★ ★ ★

✦ The Ontario Veterinary College, Departments of Anatomy and Small Animals, was judged first place winner among the 15 educational exhibits for its display, "Practical Plastic Prosthesis for Femoral Head," at the AVMA annual meeting in Toronto in July. Dr. James Archibald and Dr. John Ballantyne were co-sponsors of the exhibit.

★ ★ ★ ★

✦ The Register of Veterinarians, which was sponsored jointly by the AVMA in coöperation with the National Science Foundation, has now been established (*see* JOURNAL (April, 1952): 204, 225-226). Information submitted by 10,737 veterinarians has been recorded on machine-tabulating cards which now makes it possible to obtain certain statistical information about the profession never before available.

★ ★ ★ ★

✦ Among the 3,501 registrants at the Toronto meeting in July were nearly thirty representatives from the following countries: Argentina, Cuba, the British West Indies, the Bahamas, Hawaii, Holland, Ireland, Israel, Mexico, Peru, Thailand, and West Africa.

THEY KNOW WHAT IT TAKES

There's been a face-lifting going on at the King & Anderson Ranch, Inc., just outside Clarksdale, Miss. Big things are happening there as President W. K. Anderson (right) and Herdsman David Crighton convert long-farmed cotton land into lush pasture for cattle and hogs.

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SINCE THE HEALTH OF YOUR DOGS is so important to you, experimenting with untried dog foods is something you don't dare risk!

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P-R-O-L-O-N-G-E-D action
penicillin compound

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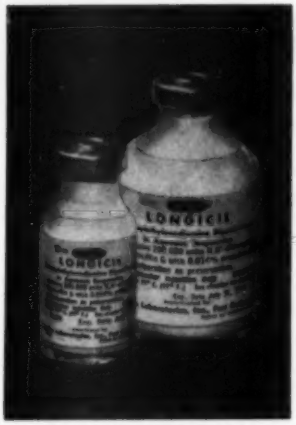
In cattle... one injection provides effective penicillin blood levels within 1 hour ...maintains those levels *for 6 to 9 days*



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This important addition to the antibiotic field is already considered by many of its first users to be the antibiotic of choice where penicillin blood levels should be maintained over a prolonged period.

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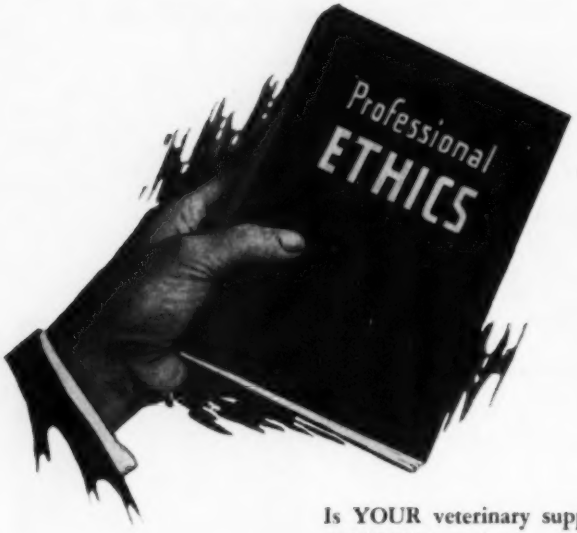

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Bone Meal	100.0 mg.
Dicalcium Phosphate	500.0 mg.
Ferrous Gluconate	0.5 gr.
Wheat Germ Oil	1.0 min.
Lecithin	30.0 mg.
Cephalin	30.0 mg.
Inositol Phosphatides	30.0 mg.
Soy Bean Oil	1.0 min.
Choline	5.0 mg.
Vitamin A	2000 U.S.P. units
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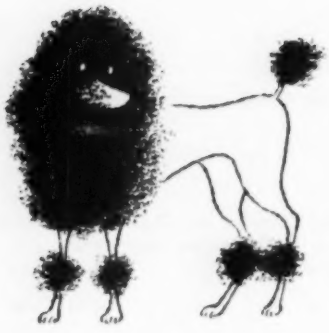

First Aid Minor Surgery	All-purpose operative antisepsis	Cleansing, sanitizing, deodorizing
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"...nearly 100% positive in the treatment of epistaxis in race horses."[4]

"No untoward side effects or incompatibilities were noted."[5]

Chatham

(1) Whitney, G. D.: J. Am. Vet. M. A. *122*:21, 1953.
(2) Blamey, E. R.: J. Am. Vet. M. A. *119*:291, 1951.
(3) Klausman, B. S., Brown, H. W.: Vet. Med. *47*:235, '52.
(4) Scott, M. L.: Vet. Med. *48*:95, 1953.
(5) Klausman, B. S.: Vet. Med. *46*:282, 1951.

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Long-Acting Veterinary Corticotropin (ACTH) in Gelatin

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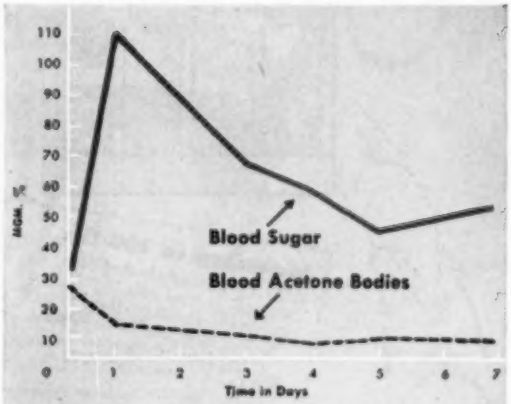
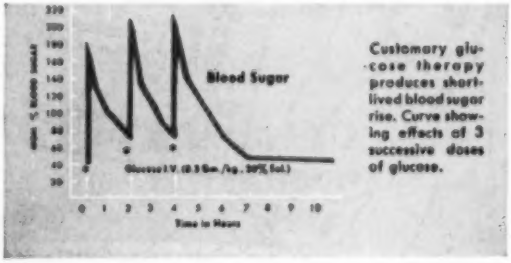
A single injection of Adrenomone rapidly reverses the symptoms of ketosis in dairy cows in the majority of cases. The metabolic disturbance is corrected and milk production is quickly brought back to normal. Adrenomone is superior to all other known forms of treatment because it is truly specific—effective in nearly all instances—rapid-acting—simple to administer—and economical.

Adrenomone is standardized in Armour Veterinary Units.

Available in 5 cc. and 10 cc. vials containing 20 A.V.U. per cc. Also supplied in 10 cc. vials containing 60 A.V.U. per cc.



Specific effect of Adrenomone showing rapid recovery from single injection of 600 A.V.U.



Customary glucose therapy produces short-lived blood sugar rise. Curve showing effects of 3 successive doses of glucose.

*Administration of glucose

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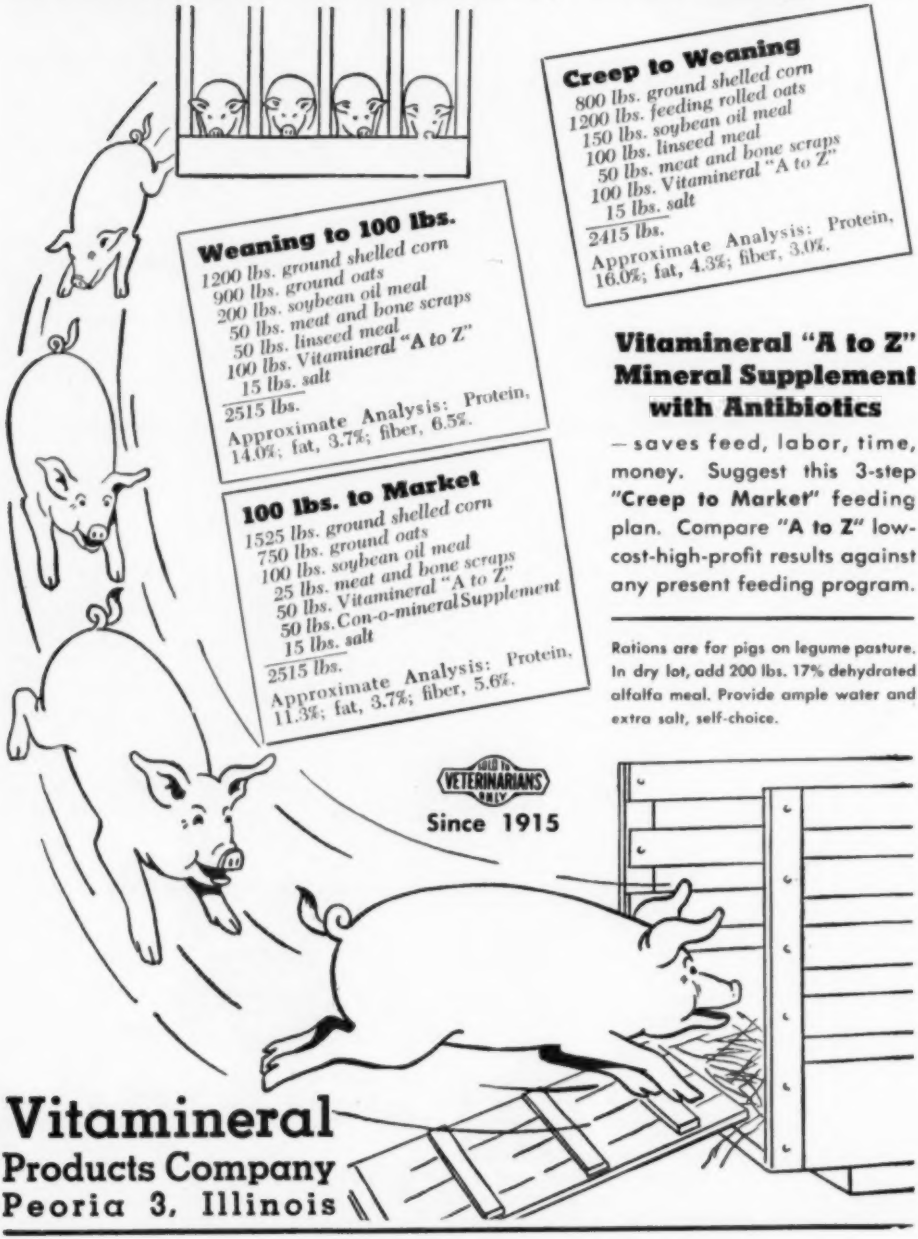
Bigger, healthier pigs easier, faster, cheaper



Creep to Weaning

800 lbs. ground shelled corn
1200 lbs. feeding rolled oats
150 lbs. soybean oil meal
100 lbs. linseed meal
50 lbs. meat and bone scraps
100 lbs. Vitamineral "A to Z"
15 lbs. salt

2415 lbs.

Approximate Analysis: Protein, 16.0%; fat, 4.3%; fiber, 3.0%.

Weaning to 100 lbs.

1200 lbs. ground shelled corn
900 lbs. ground oats
200 lbs. soybean oil meal
50 lbs. meat and bone scraps
50 lbs. linseed meal
100 lbs. Vitamineral "A to Z"
15 lbs. salt

2515 lbs.

Approximate Analysis: Protein, 14.0%; fat, 3.7%; fiber, 6.5%.

100 lbs. to Market

1525 lbs. ground shelled corn
750 lbs. ground oats
100 lbs. soybean oil meal
25 lbs. meat and bone scraps
50 lbs. Vitamineral "A to Z"
50 lbs. Con-o-mineral Supplement
15 lbs. salt

2515 lbs.

Approximate Analysis: Protein, 11.3%; fat, 3.7%; fiber, 5.6%.

Vitamineral "A to Z" Mineral Supplement with Antibiotics

— saves feed, labor, time, money. Suggest this 3-step "Creep to Market" feeding plan. Compare "A to Z" low-cost-high-profit results against any present feeding program.

Rations are for pigs on legume pasture. In dry lot, add 200 lbs. 17% dehydrated alfalfa meal. Provide ample water and extra salt, self-choice.

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Infectious organisms usually invade the peritoneal cavity from one of several sources: the intestinal tract, the urogenital tract, through accidental introduction from outside during surgery. The versatility of Terramycin makes it the product of choice in combating such an invasion, which may otherwise proceed rapidly to a fatal termination.

Successful therapy of peritonitis requires the rapidity of action, the broad spectrum of effectiveness and the convenience of administration offered by the veterinary dosage forms of Terramycin.

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INTRAVENOUS
250 mg., 500 mg., 1 Gm., 2.5 Gm. (with Water for Injection, U. S. P.)

INTRAMUSCULAR
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50 mg., 100 mg., 250 mg.

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GOOD OLD DOG

The firelight glows on an old dog asleep—a hunter home from the hill...

What does an old dog dream about?

Hands that were kind, hands that were cruel and the best loved hands of them all—*his* hands.

The long waits of a dog's life—waiting for the boss to come home; waiting to go for a run; waiting just to see the boss that time he was sick.

The silly mistakes of puppy-youth. Chewed-up slippers. Plopping muddy paws on the new bedspread. Picking on the wrong dogs, before he knew right dogs from wrong ones.

The time he slipped his collar and ran away. Or was he just plain lost? What a feast for the Prodigal Dog when he did get home—tired, hungry and full of burrs!

That was the night he really knew they loved him when he saw their eyes, heard their shouts, felt their pats upon his head. Ah, those were the days when life was full and life was sweet.

. . . .

Then a fellow starts to slow down.

Rabbits getting away that wouldn't have had a chance a few years ago.

The boss now waiting for him—when it used to be he'd run ahead and wait for the boss to puff up.

A little slower reflex when cars cut the corner.

Footsteps having to come a little closer before he knows whose they are.

A little shorter sight; a little duller teeth—and a lot more gray in the hair.

And when you start hitting that rug before the fireplace a little earlier every night; staying a little longer every morning, then you know you're getting old.

. . . .

An old ear lifts at some faraway noise. Then falls back. An old leg tenses. Then stretches out. An old throat growls one soft, sleepy growl. Then is still.

An old dog sleeps.

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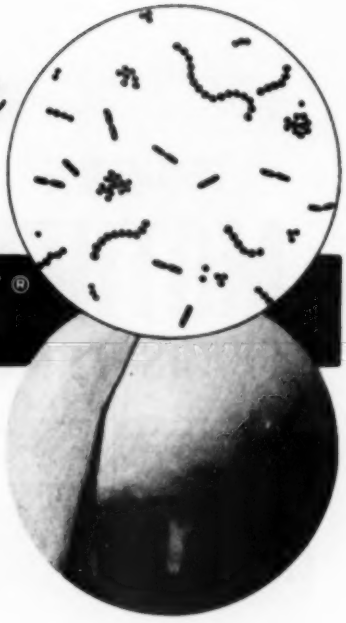

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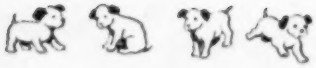

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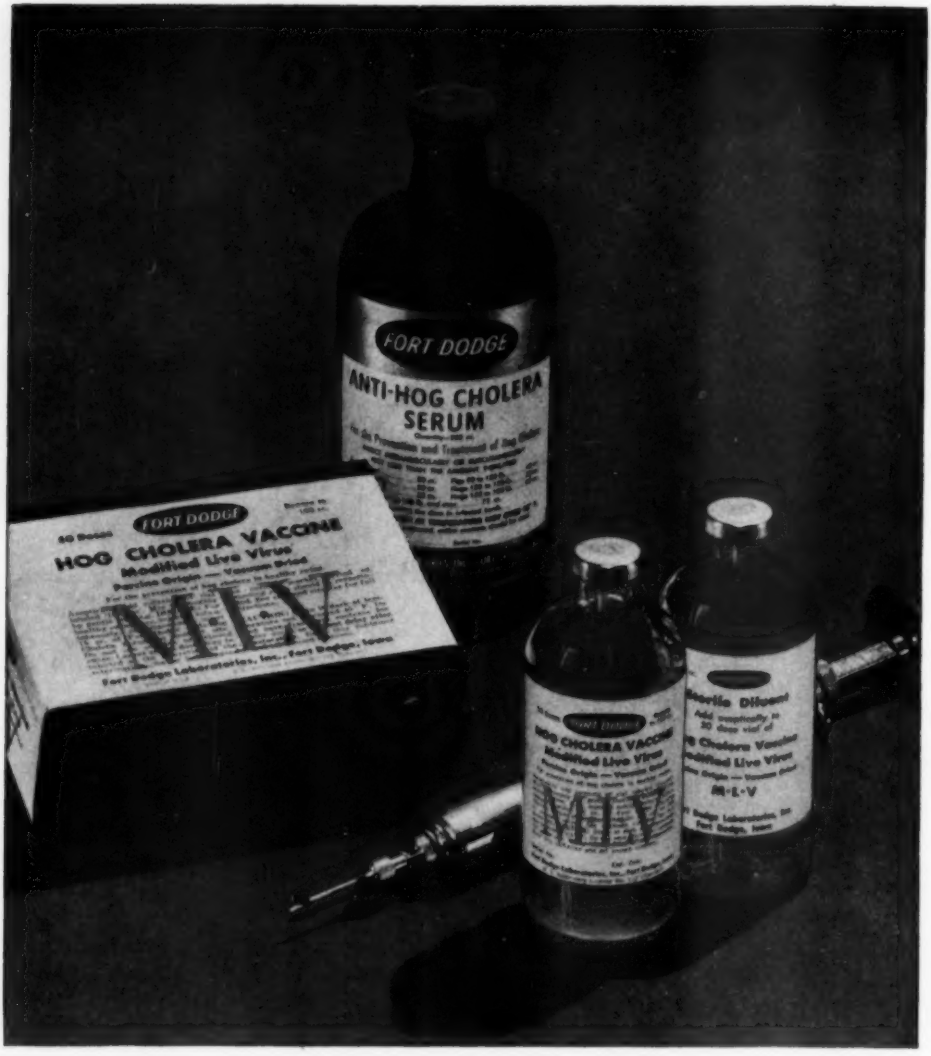

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Journal
of the
American Veterinary Medical Association

VOL. 123 SEPTEMBER, 1953 No. 918

The President's Address

W. L. BOYD, D.V.S.

St. Paul, Minnesota

ACCORDING TO the administrative by-laws of the American Veterinary Medical Association, one of the numerous duties assigned to the president is to deliver an address at the regular annual session on matters pertaining to the advancement of veterinary science. Fortunately, or should one say unfortunately, no mention is made as to the element of time that shall be devoted to the delivery of the speech.

Through the daily press, by radio, by television, and by word of mouth, we are constantly being reminded that we are living in a continually changing world. This kind of information is readily understood by the veterinarian, especially when considered biologically or economically.

An ever expanding population will face the veterinarian, along with all other workers in the field of agriculture, with an important task in the years ahead in an endeavor to produce sufficient food necessary to maintain high standards of living and thereby improve and promote human health. Experts in human population trends have estimated that the population of the United States will have increased from 152 million people to 190 million in 1975. To feed this greatly increased number of people by present day standards (at the present rate of population), 100 million new acres of productive farm land will be required. Although thousands of acres will be obtained through reclamation and irrigation, projects which, augmented by the acreage that is being released from growing crops for the feeding of horses and mules (where numbers are steadily declining), will provide an abundance of food, the acreage thus obtained will fall far below the 100 million mark.

Improved methods of disease control will greatly assist in making possible increased agricultural production.

Through research, the veterinarian will discover and devise new and improved methods of diagnosis and treatment, both preventive and therapeutic. The successful control of diseases of newborn animals, which are at present responsible for tremendous losses, will be of untold value in meeting new food-production goals. Veterinary medicine can never remain static; it will either progress or retrogress. The degree to which veterinary medicine will continue to advance will be measured by

Dr. W. L. Boyd

Delivered at the Ninetieth Annual Meeting of the American Veterinary Medical Association, Toronto, Ont., July 20-23, 1953.

the extent or degree to which we support, prosecute, and utilize the developments of our research programs.

EDUCATIONAL TRENDS

The number of young men interested in studying veterinary medicine has increased greatly in the past decade. With a rapidly increasing population, the time is not far distant when many, if not all, present day schools will be hard pressed to provide facilities essential for the training of all the qualified resident applicants of their respective states. Numerous states, mainly those of the southern part of the United States, that do not have schools of veterinary medicine, have partially solved this problem by participating in the regional educational program now in operation in several colleges and universities.

A regional education program designed primarily for the healing arts professions is also being developed in the West or Rocky Mountain area, and enabling legislation has been introduced in the present session of Congress. This type of training has many advantages, one of which should be of material aid in determining when and where additional schools should be located. Programs such as these are also beneficial in providing for continued financial support, which in itself is a most important matter.

One of the most stimulating observations that I have made while attending various meetings and conferences of veterinarians during 1952-1953 has been the large number of young people among those in attendance. This is a situation that one would quite naturally anticipate, as all of our new schools have at this time graduated one or more classes and the total output of veterinary graduates for the past three years from all 19 schools has been about 75 per cent greater than the prewar average. While a few more states are at this time considering the possibilities of inaugurating new schools, the urge to do so is not nearly as great as was the case just a few years ago. Another problem confronting the veterinary medical school faculties is that of adjusting the curriculums from time to time in order to meet the constantly changing agricultural and public health demands and practices. Teaching students the art and science of veterinary science alone will not fully prepare them for positions of public leadership.

Providing more opportunities for securing additional cultural training is exceedingly difficult; especially when dealing with an already overcrowded curriculum. It is, however, becoming more and more evident that the veterinarian of the future must by some manner or means secure more cultural training. This he must do if he is to assume leadership in the community in which he resides. Just what the ratio of cultural, scientific, and practical training should be is difficult to state, but these aspects should coëxist in a way that will enable the graduate veterinarian to pull his own oar completely. It is refreshing to note the extent to which our schools are expanding and integrating their research activities with the teaching program. A combined program of research and teaching is stimulating to the teacher and beneficial to the student. Such practices will be of material assistance in attracting more students to choose a career of teaching and research.

The observer of the operation of the modern schools of veterinary medicine is delighted to note that the student in the clinical subjects no longer occupies the position of an onlooker or observer but, instead, is encouraged and required to actually participate in the various clinical practices. The schools of veterinary medicine in North America are making unusually good progress, but the road ahead which must be traveled in order to attain greater success is not entirely free of hazards. Veterinary medical education is expensive, being, in this repect, second only to medicine. To meet the increased educational demands of the next decade, which will probably see a greatly increased number of students in all of our colleges, will necessitate continual assurance of strong financial support. In this connection, I recommend that the AVMA, through the Council on Education, explore the advantages offered by regional education plans as one of the ways whereby our schools may, in part, be assured of regular and adequate financial support.

RESEARCH

That we are living in an era of research, there is no doubt. Research as a topic for

discussion is, in general, very popular. While the public shows an increased knowledge and interest in science, few are the number who fully appreciate the importance and significance of research.

THE RESEARCH FUND PROGRAM

The response to the Research Fund drive, which was renewed at the 1952 AVMA meeting held in Atlantic City, has been good, but there is lots of room for improvement. Obtaining funds for the conduct of research is not, as many know, an easy matter, particularly when such funds are in part to be spent in the conduct of fundamental studies. We can not buy research with money alone, but there must be available at all times a source of funds that will permit expansion of our researches in animal diseases or the menace of these will definitely increase. To those who may doubt the feasibility and advisability of an expansion of research in animal disease, we call their attention to the alarming and serious situation which recently occurred with the sudden and spectacular widespread dissemination of vesicular exanthema and anthrax. These two diseases, which only a comparatively short time ago were not regarded as constituting a serious threat to the health of animals and man in the United States, struck with such rapidity and subtleness that they were able to invade comparatively large areas of new territory without immediate recognition.

The diseases which an enemy would be most apt to employ in biological warfare and which at present do not occur in North America are: foot-and-mouth disease, rinderpest, Teschen disease, and the very destructive form of Newcastle disease. To cope successfully with these diseases would require prompt reporting, early and accurate diagnoses, and adoption of rigid quarantine and control measures. The reporting of disease, which at present is sketchy at best, is a vital factor in setting up disease control organizations.

The graduate-training program sponsored by the American Veterinary Medical Research Council has been productive of excellent results. Because of the need of a better understanding of the ways in which animal diseases behave and because of the pressing need of a source of recruitment of research workers with specialized training, the veterinarians of the United States and Canada must not allow the Research Fund project to disintegrate. That all of our efforts toward expanding animal disease research have not been in vain, we call attention to an act of the Eighty-Second Congress which provides for the establishment of an animal research laboratory on Plum Island in Long Island Sound, New York. This laboratory, which is to be constructed and equipped for the study of foot-and-mouth disease, will be used for the study of other diseases also.

Outstanding results and achievements in research during recent times include (1) the solution of the hyperkeratosis problem; (2) the development of a method for the diagnosis of atrophic rhinitis; (3) the development of a vaccine for the control of leptospirosis; (4) the development of a vaccine for the prevention of keratoconjunctivitis; (5) the perfection of new vaccines for the prevention and control of hog cholera; (6) the perfection of immunizing agents in the prevention of Newcastle disease, also the development of vaccines for the prevention of canine distemper and hepatitis; (7) progress in the investigation of aplastic anemia as a result of feeding cattle on soybean meal in which trichloroethylene had been used as the solvent.

Fundamental research studies in the subjects of anatomy, physiology, pharmacology, parasitology, radiology, and nutrition, which are more difficult to evaluate, have been productive of results that have added greatly to the advancement of veterinary science.

PUBLIC RELATIONS AND PUBLIC INFORMATION

The public relations and public information program, which was begun in a small way by the AVMA in 1938, has now developed to the stage where it provides a large and important number of services. In order that the membership may be more thoroughly appraised of the nature and character of the different basic services of the department, each and every member is urged to read the leaflet on membership services and related activities which was mailed to all members during the last part of February, 1953. To know that a portion of the income that will be derived from increased dues will be used in expanding our public relations and public information activities will, I am certain, have the approval of all members. It is also encour-

aging to know that, in addition to having AVMA representation in Washington, D. C., there will probably be an increase in the public relations staff of the central office.

While a great deal of effort and time has been spent in an attempt to acquaint the general public with the ideals, activities, and functions of veterinary medicine, there still remains a large segment of our population which possesses only a meager and often incorrect knowledge of our profession. I recommend that the AVMA expand its services to, and aid the progress of, the various state and local veterinary medical associations and conferences. The attendance at these meetings is in need of stimulation. While attendance at our professional association meetings is gradually improving, the number of veterinarians who fail to attend regularly is still too large.

A campaign to arouse interest in both local and state societies will result in an improvement of human relations. The man who isolates himself from his fellow veterinarians is soon lost. He needs the benefits offered by the society, and the society or association, on the other hand, needs him. Neither can prosper without the assistance and coöperation of the other. The women's auxiliaries are of great help in establishing greater interest in attendance. For this we are most appreciative.

VETERINARY MEDICINE AND CIVIL DEFENSE

Civil defense efforts move slowly. To know that this is true, one need only to review the character and extent of our efforts in joining hands with the Federal Civil Defense Administration. At the annual meeting in 1951, we were urged to prepare for any and all emergencies that might arise in the event that we might become involved in World War III. To successfully meet and repel and enemy that might resort to chemical, atomic, or biological warfare against our animal population will require an alert, sound, and effective organization for the diagnosis and control of transmissible diseases. Regional meetings for the purpose of organizing our civil defense forces have been conducted by the Bureau of Animal Industry of the United States Department of Agriculture. The bureau has also conducted conferences for the purpose of increasing the efficiency as well as the number of veterinarians skilled in the art of diagnosis, particularly as related to the diagnosis of vesicular diseases. The program of the BAI in these respects indicates an appreciation of the possible dangers of biological warfare, and we trust that meetings and schools designed for establishing a more thorough and efficient disease control organization will be continued.

If we were in a state of lethargy as related to the seriousness and importance of bacterial warfare against domestic animals in 1951, we were jolted out of it with the sudden and unexplainable occurrence of foot-and-mouth disease in Canada and the equally sudden and, for a time, unexplainable widespread occurrence of anthrax and vesicular exanthema in the United States in 1952. Prior to this period, these two diseases, that is anthrax and vesicular exanthema of which we possess an abundance of scientific knowledge, were regarded in general as being largely of certain local geographical interest and importance.

We must not, when considering the seriousness of biological warfare, overlook the importance of the diseases which we see commonly. If we are to safeguard the nation's livestock industry and assist in protecting the health of the people, we must continue to wage relentless war against such diseases as tuberculosis, brucellosis, hog cholera, Newcastle disease, leptospirosis, and numerous other infections which, if allowed to go unchecked, would cause disasters equal to, or even greater than, certain diseases which at present do not exist in North America. If we were lethargic in respect to the importance of civil defense in 1951, we must today be fully awake and appreciative of its present importance. Recent experience with certain diseases, some of which were referred to above, has furnished a strong motivating influence. It is high time that the veterinary profession should play a more active role in matters of civil defense. We must be ever vigilant and prepared at all times to attack disease wherever it may appear. Expanding our research will increase our efficiency. This is no time to declare a moratorium on research.

CONCLUSION

If there is any activity or function of

the American Veterinary Medical Association in which I may have a special interest, it is in the field of education and research. These are changing times and we are also aware of the fact that, in addition to living in an era of research, we are living also in an era of organization. Teachers must be provided with the opportunity of conducting research for, without this privilege, teaching becomes laborious and mechanical to many. I, therefore, recommend that our Association, through the Council on Education, continue to emphasize the importance of expanding and integrating the teaching and research programs of all of our veterinary schools and colleges in North America. This would not only be beneficial to the teacher but would be helpful and stimulating to the student. I further recommend that the Research Council continue to emphasize the importance and need of fundamental research. The fellowship research-training program must be continued.

I wish to take this opportunity of thanking the AVMA officers and the committee chairmen and members for their splendid help and coöperation during the past year. I wish to thank the editorial staff for the stupendous labors they are so efficiently performing. I take this opportunity also to express my sincere thanks and appreciation to all members of the central office staff who have given so liberally of their time. Their help has made the work of the president easy and most enjoyable. Last, and from the innermost portion of my heart, I wish to thank all members of our Association for having had the honor and distinction of serving you as your president during the past year. I shall long cherish and remember this honor.

Brief Facts About Vesicular Exanthema

The incubation period varies from eighteen hours to fourteen days — possibly longer — but it is usually less than a week. The greater the exposure, the shorter the incubation period. The vesicles which form on the feet and/or snout usually rupture in twenty-four to forty-eight hours. During the vesicular state, the temperature is commonly 105 to 107 F. but may be 108 F. Hogs may lose 5 to 10 per cent of their weight while affected. Their marketing time is delayed thirty to sixty days. The

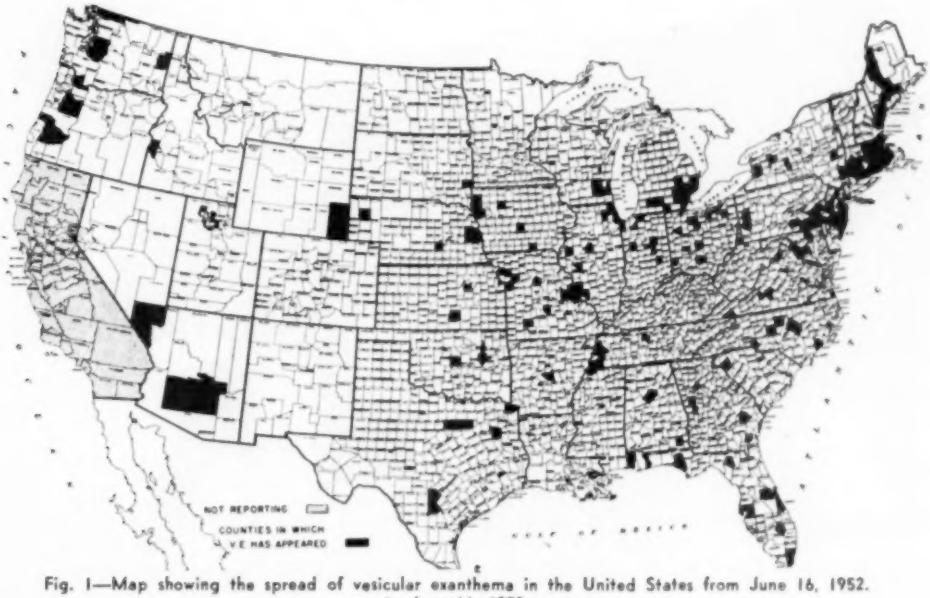

Fig. 1—Map showing the spread of vesicular exanthema in the United States from June 16, 1952, to June 16, 1953.

residual infection in a pen or vehicle will persist for at least seventy-two hours. The time lapse between the first temperature rise and the first lesions will average about twelve hours. Thirty per cent of the infected animals may show no significant temperature rise.

The infected animal can spread virus from the time it develops a temperature. From 3 to 90 per cent of a previously unexposed herd will show lesions. Under normal refrigeration, meat from infected hogs will contain virus for at least two months.

Vaccines would not be practical since there are at least three types of virus and the only source of the vaccine virus is the hog. In California, the occurrence of vesicular exanthema has been 1,000 times as great in garbage-fed hogs as in grain-fed hogs. Cooking garbage may destroy vitamins but it does not materially affect the food value. The majority who have fed cooked garbage would not return to feeding raw garbage. It is impossible to say when the meat of recovered hogs would be free from virus.—*U.S.D.A., June 30, 1953.*

TABLE I—Total Number of Swine Liquidated in the Vesicular Exanthema Eradication Program, Sept. 14, 1952, through June 20, 1953

State	Number	State	Number
Alabama	1,915	Nebraska	12,364
Arizona	3,554	New Hampshire	8
Arkansas	86	New York	4,711
Connecticut	12,972	North Carolina	749
District of Columbia	1,310	Ohio	4,182
Florida	2,144	Oklahoma	1,219
Georgia	2,430	Oregon	3,627
Idaho	388	Pennsylvania	4,514
Illinois	15,274	Rhode Island	7,361
Indiana	2,102	South Carolina	14
Iowa	4,930	South Dakota	4,213
Kansas	8,141	Tennessee	1,849
Kentucky	10	Texas	4,215
Maine	1,266	Utah	450
Maryland	5,705	Virginia	10,730
Massachusetts	8,566	Washington	6,059
Michigan	10,537	West Virginia	104
Mississippi	825	Wisconsin	2,394
Missouri	11,702	Wyoming	2,238
Total	164,858		

The most perfect protection against infectious disease is complete isolation, but it is impractical.—*H. C. Stephenson, D.V.M., Ithaca, N. Y.*

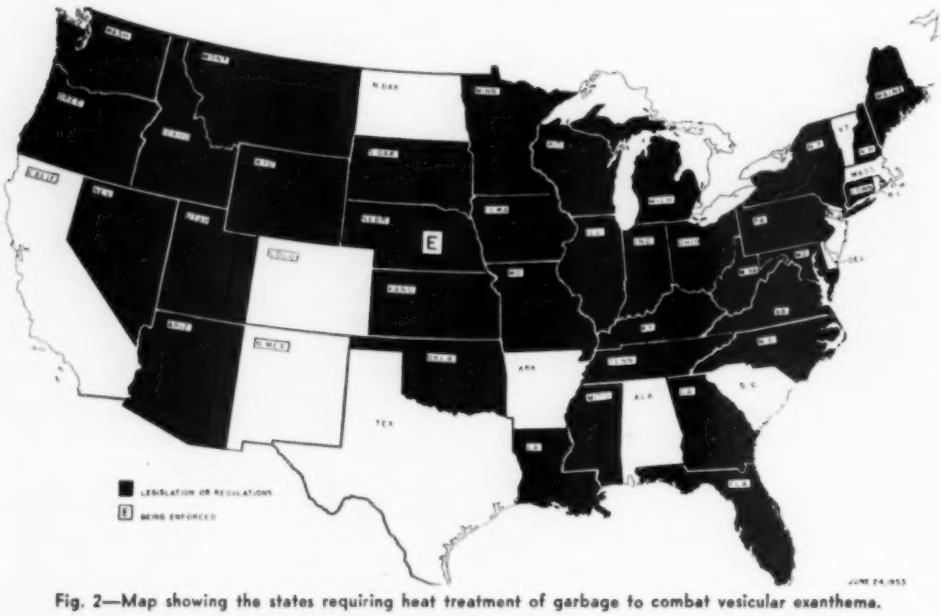

Fig. 2—Map showing the states requiring heat treatment of garbage to combat vesicular exanthema.

SURGERY & OBSTETRICS
AND PROBLEMS OF BREEDING

A Method of Visualizing the Urinary Tract and a Basis for Assessing Renal Function in Small Animal Radiography

E. J. BISHOP

Guelph, Ontario

THE URINARY tract is not well visualized on a normal radiograph. The general outline, size, and shape of the organs and vessels involved should be visible on a good soft tissue film of the abdomen but, because they lie deep in the abdominal cavity and are of similar radiographic density to adjacent tissue, little detail is apparent. In order to visualize the details of these structures radiographically, one has to introduce a radiopaque dye or contrast medium that outlines the structures of interest without invading other tissue or obscuring the desired detail.

Working together, physiologists and chemists have developed a range of dyes that makes it possible to render visible most of the organs and vessels which, because of their structure or position, would not otherwise be seen in sufficient contrast.

The dyes developed for investigation of the urinary tract are made up of two main constituents closely combined chemically. One of these is iodine which, because of its high atomic number, is highly opaque to x-rays and lends this opacity to the area of interest when present in sufficient quantity. The second constituent, known as the "carrier," ensures that the dye arrives at the correct destination, *i.e.*, that it undergoes renal deviation and is rapidly excreted. This constituent also renders the iodine physiologically inert and prevents absorption of the dye by surrounding tissues.

There are two generally accepted methods of introducing the contrast medium into the urinary tract: (1) the instrument method or retrograde pyelography, and (2) the excretory method or intravenous pyelography (i.v.p.).

Retrograde pyelography depends upon the introduction of radiopaque catheters into the ureters with cystoscopic control. The final position of the catheters is checked fluoroscopically and the contrast medium is then introduced into the kidneys by way of these instruments. Excellent detail is obtained by this method. The dye can be retained in the region as desired and a comparatively low concentration of dye gives good contrast. Details of kidneys which have ceased to function can also be obtained.

The great disadvantage of this method is the difficulty encountered in introducing the catheters. This step is difficult in a large female, and is almost impossible in some small females or males, even assuming a cystoscope of suitable size is available. In view of these problems and the fact that no information regarding function is obtained, it is felt that retrograde pyelography leaves much to be desired.

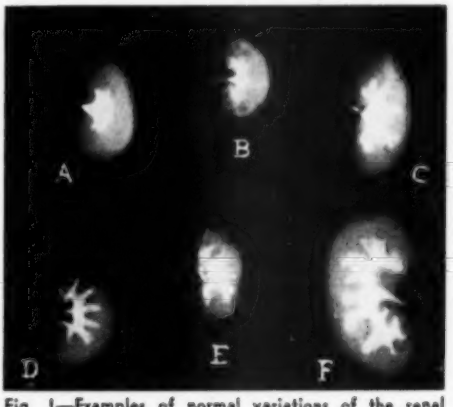

Fig. 1—Examples of normal variations of the renal pelvis in dogs.

Mr. Bishop is an associate member of the Institute of X-Ray Technology of Great Britain, and is a member of the faculty of the Ontario Veterinary College, Guelph.

The author acknowledges with gratitude the assistance of Drs. James Archibald and N. M. Brown of the Small Animal Division, Dr. S. W. Nielsen of the Department of Pathology, and Miss Marcia Tanner, M.S.R., of the Radiology Division, Ontario Veterinary College.

The excretory method or intravenous pyelography relies, as its name implies, on the normal function of the kidney. The contrast medium is injected into a convenient vein, and after a suitable interval a series of radiographs is taken to record the structure of the kidneys and ureters as outlined by the excretion of urine containing the contrast medium. The degree of kidney function present can be observed and recorded, and detail of the ureters can be observed by suitable compression. Instrumentation and its concomitant risks are avoided.

This method has three disadvantages: (1) A high concentration of dye must be injected in order to obtain adequate contrast in the kidney region; (2) some slight risk of toxic or allergic reaction is involved; (3) if function is severely impaired, detail will not become visible during the course of the examination.

The frequent occurrence of kidney ailments and the inability of the radiology division at the Ontario Veterinary College to demonstrate more than a rather vague outline indicated the need for an improved technique. It was decided to employ the technique on a number of dogs of various breeds, size, and sex to prove its efficiency and to obtain a record of normal variations so that abnormalities might more easily be recognized.

PROCEDURE

Adequate preparation of the animal is of paramount importance. Food and water should be withheld for twelve hours before the examination. The bowel should be evacuated by means of an enema immediately before the animal is anesthetized and taken to the x-ray room. Anesthesia is considered desirable as the animal must be retained on its back with compression on the lower abdomen for approximately one hour. The anesthetic also minimizes the unpleasant sensations which appear to be common side-effects of the contrast medium. Pentobarbital sodium (nembutal®) has proved a satisfactory anesthetic, since it allows the radiographer an hour in which to carry out the examination.

In the x-ray room, a lateral film of the kidney region should first be taken. The animal should then be secured on its back in a ventrodorsal position. This position can be achieved and maintained by placing a 1-gallon carton of x-ray chemicals on either side of the thorax and drawing a compression band securely across both thorax and cartons. This method has been most helpful in connection with the deep-chested breeds. It is important to secure the whole animal in a feasible position and in correct alignment. If the x-ray table can be angulated so that the animal's head can be lowered after injection, the hind legs should be secured so that the body will not slide when the table is tilted. A pad of cotton wool or similar radiotransparent material should be molded to fit the pelvis between the sacroiliac joints and applied by means of a compression band or bandage to compress the ureters where they enter the pelvis. Care should be taken with male dogs to ensure that the pad fits on either side of the os penis; otherwise, pressure is not applied to the ureters.

When the animal has been secured in a satisfactory position, a ventrodorsal picture should be taken and processed.

Before injecting the contrast medium, the two films should be examined for the presence of the following essential conditions: (1) freedom of the abdomen from gas or fecal shadows; (2) suitability of the x-ray exposure factors for the individual patient and proposed examination; and (3) absence of undesirable shadows caused by the pad and compression device. Steps should be taken to remedy the situation if any of the above conditions are absent. Any attempt to proceed with the examination of an animal which shows evidence of poor preparation or film quality will only result in waste of expensive material and time.

When satisfactory film quality and condition of patient have been achieved, the contrast medium is administered. The fluid, warmed to body temperature, is injected into a convenient vein such as the cephalic or saphenous. The injection should be given slowly, and thirty to forty seconds should be allowed to elapse after the administration of 1 to 2 cc. This precaution enables the observation of any undesirable reactions before the full quantity of contrast medium is introduced. The remainder of the dye should then be injected, taking three to four minutes for 20 cc. The time should be noted at the moment the contrast medium begins to flow into the vein, and this becomes the reference point for all subsequent films.

As soon as the injection is completed, the x-ray table is angulated so that the animal's head is 20 to 30 degrees below horizontal. By this means, gravity helps maintain the contrast medium in the ureters and renal pelves.

Ten minutes after the injection of the dye, a film should be taken of the ventrodorsal aspect, using a marker to indicate the elapsed time. All future films should have a suitable marker to record how long after the injection each film was taken.

The ten-minute film should be processed and examined. If contrast medium appears in the bladder but details of one or both kidneys and ureters is absent, the compression device should be checked and adjusted to ensure even and adequate pressure. In view of the heavy muscle formation in the pelvic region, the pressure must be firm.

Twenty minutes after the contrast medium has been injected, a ventrodorsal film should be taken

and examined. If details of kidneys and ureters are present, a thirty-minute exposure should be taken in the ventrodorsal aspect, followed by one in the lateral aspect, using the same view as employed for the first control film. For this step, the film should be placed in position and the x-ray technique adjusted before compression is released from the animal's abdomen, thus making it possible to obtain the lateral film with minimum delay after pressure has been removed. A lengthy delay in positioning the animal would permit the contrast medium to enter the bladder and result in the loss of details of the kidneys and ureters in the lateral aspect.

If no contrast medium can be observed on the twenty-minute film, additional ventrodorsal views should be taken at thirty, forty-five, and sixty minutes following the injection, and a lateral film taken as suggested above after the sixty-minute ventrodorsal view.

It is sometimes difficult to administer the dye intravenously, especially in small breeds of dogs and in cats. In the writer's studies, 2 dogs and 4 cats have been examined by injecting the dye into the biceps femoris. The resultant pyelograms were of poorer quality than those obtained intravenously, but it is felt that some knowledge of function can be obtained in this manner. When intramuscular injection is employed, the contrast medium takes longer to reach the kidneys; hence films should be exposed at twenty-five, thirty-five, and forty-five minutes after injection.

RADIOGRAPHIC CONSIDERATIONS

In order to record successfully soft tissue detail of the abdomen, several requirements must be met. First, the dog must be adequately prepared. Second, a combination of exposure factors must be used to provide maximum contrast. (Contrast may be defined as the difference in degree of blackness between adjacent areas.) Finally, a fast, yet contrasting, x-ray film is necessary.

The need for thorough preparation has already been emphasized. A high, warm enema applied with patience and persistence will ease a variety of conditions and will certainly improve the visibility of film detail.

To obtain a film of maximum contrast between two adjacent areas of only slightly differing density, it is necessary to employ low kilovoltage and a high combination of milliamperes and time (milliampere seconds). The complete exposure must be made while the animal is still. This length of time was found to be usually not less than 0.4 second and seldom more than 0.7 second, and to occur at full expiration. The duration depends upon the animal, depth of anesthesia, and reaction to the contrast medium.

The final degree of contrast desirable in a film is largely a matter of personal choice. It must be sufficient to outline the areas of interest. To increase contrast and maintain film density, the kilovoltage should be reduced and the exposure time increased. To reduce time, the kilovoltage may be increased and the exposure time reduced. Some contrast is lost by this last procedure, but it often permits a radiograph to be obtained in cases where increased respiration or other movement would otherwise make it impossible.

When it is desired to shorten exposure time and no kilovoltage control is fitted to the machine, focal film distance may be varied. It is possible to arrive at an approximately correct figure by reducing the distance by one-quarter and halving the exposure time.

If the x-ray generator is rated at 60 ma. or more, a Potter-Bucky diaphragm or stationary grid should be employed to reduce the scattered radiation reaching the film. However, since the exposure time should be increased three and one-half times or the kilovoltage increased by 12, it must be decided if the increased risk of involuntary movement when a longer time is used will be justified by the improved film, *i.e.*, if detail obtained by the longer time and Potter-Bucky diaphragm will be lost by involuntary movement.

For example:

If a 35-lb. Collie can be successfully radiographed at:

53 kv.p.	100 ma.	0.6 seconds	36-in. focal-film distance with Potter-Bucky diaphragm,

the exposure may be shortened by increasing kilovoltage

60 kv.p.	100 ma.	0.3 seconds	36-in. focal-film distance with Potter-Bucky diaphragm.

Most portable x-ray units with fixed kilovoltage have an output of 60 to 65 kv.p. so that with a portable unit of 20 ma. output, a starting technique might be

60-65 kv.p.	20 ma.	0.5 seconds	36-in. focal-film distance with no Potter-Bucky diaphragm or grid.

With a 10-ma. portable for a similar animal, the figures would be

60-65 kv.p.	10 ma.	0.5 seconds	25-in. focal-film distance with no Potter-Bucky diaphragm or grid.

All of these factors assume that fast film is in use with intensifying screens and that the film is then given full development.

Most film manufacturers market three types of film for medical use. A nonscreen

type which is used without intensifying screens is not suitable for radiography of the abdomen because of the long exposure time necessary. For use with cassettes, two types of screen film are available—a standard type and a fast type. When used with intensifying screens, varying degrees of contrast speed and latitude can be obtained. The film found most suitable for this work was Ilford Red Seal. This was exposed in cassettes fitted with Patterson par-speed intensifying screens.

CONTRAST MEDIUM

A number of radiopaque dye preparations are commercially available for intravenous pyelography. Most of these contain iodine as the opaque agent; it is chemically combined with, and made physiologically inert by, an organic radical which suffers renal deviation.

Most human urography is undertaken with a 35 per cent weight per volume concentration of dye. In our work, it was found difficult to achieve a detailed outline with this concentration especially in small animals. However, a 70 per cent weight per volume concentration is available, and this has produced consistently diagnostic results in normal animals.

The manufacturers warn that certain dangerous side-effects may be encountered when this type of contrast medium is employed. The most serious reaction appears to be an allergy to iodine. Caution should also be observed when these preparations are used in animals with heart disease, circulatory failure, liver disorders, nephritis, and hyperthyroidism. However, the majority of side-effects noted appear to come under the heading of unpleasant sensations rather than actual hazards, and if the animal is anesthetized their effect is minimal. No untoward results have been observed in the series undertaken by the writer.

A satisfactory scale of dosage is given in table 1.

It is felt that some reference should be made to the cost of materials for this examination. A 20-cc. ampule of 70 per cent contrast medium and six films cost $8 to $10. This figure does not allow for apparatus depreciation or time of the radiologist.

TABLE 1—Satisfactory Dosage Scale of Contrast Medium in Small Animal Radiography

Weight of animal	Dosage (cc. /lb. of body weight)
Up to 10 lb.	1 cc.
10-15 lb.	10 cc.
15-30 lb.	15 cc.
30-45 lb.	20 cc.
45 lb. and up	25 cc.

OBSERVATIONS

In a consideration of radiographic anatomy, the surface landmarks useful in limiting the field for intravenous pyelography are the caudal end of the sternum and the acetabulum. A film of sufficient size to include these parts should be used.

The kidneys appear deep in the abdomen in the region bounded by the thirteenth thoracic and third lumbar vertebrae. These organs lie on either side of the spine with the long axis of each parallel to it. The classical kidney shape is apparent in the ventrodorsal aspect with the hilus directed medially. The size of the kidneys appears to correspond closely to that of two and one-half to three adjacent vertebrae.

In our work, considerable variation was observed in the position and attitude of the kidneys. Since care had been taken to make the exposure always on full expiration and since the animals were all adequately prepared, it is assumed that these were normal variations. In some animals, the kidneys lay at the same level. More often, the right kidney was half a vertebra craniad to the left. Some degree of divergence of the posterior poles was fairly common.

The macroscopic structure of the kidneys also showed considerable variation. The renal pelvis on either side of the renal crest varied from a simple arrangement with slight indentations to a complex arrangement of five, six, or seven subdivisions which strongly resembled calyces in other species. Secretion was observed in these subdivisions as soon as dye was apparent at any point in the renal pelvis. When kidneys were injected with contrast medium following removal, it was possible to observe renal back flow into the medulla from the terminations of the subdivisions (fig. 1B).

In the 56 pairs of kidneys examined (21 by intravenous pyelography and 35 by postmortem), six had a simple renal pelvis with no subdivisions (fig. 1A); ten appeared to have five pairs of subdivisions (fig. 1C);

eight had six pairs of subdivisions (fig. 1D); and 32 were found with seven pairs of subdivisions (fig. 1F). These subdivisions were similar to those observed in the kidneys of some pigs and some human beings. The subdivisions also varied in form, some appearing to have parallel sides of equal thickness throughout the length, others broadened and flattened at their extremity. In the number examined, no marked characteristic associated with age or breed could be noted.

Elias[5] states that the kidney of a large dog may resemble that of the pig. Sisson and Grossman[7] group the pig and man together as possessing calyces. Miller[8] and the latter workers[7] state quite definitely that the dog's kidney lacks calyces; instead, buttress-like structures resembling calyces proceed from the renal crest. In the kidneys examined during this series, subdivisions of the renal pelvis resembled calyces more strongly than the buttress-like structures described by Sisson and Grossman. These subdivisions were present in 90 per cent of the kidneys examined.

The ureters emerging at the hilus were inevitably affected by variations in the position of the kidney. Coursing posteriorly at approximately the border of the transverse spines of the lumbar vertebrae, they converged on entering the pelvic region and crossed the sacrum slightly medial to the sacroiliac joints. They continued caudad to the bladder, doubling back to enter from the ventrocaudal aspect. The route of the ureters showed slight variations, most particularly in the degree of kinking and tortuosity.

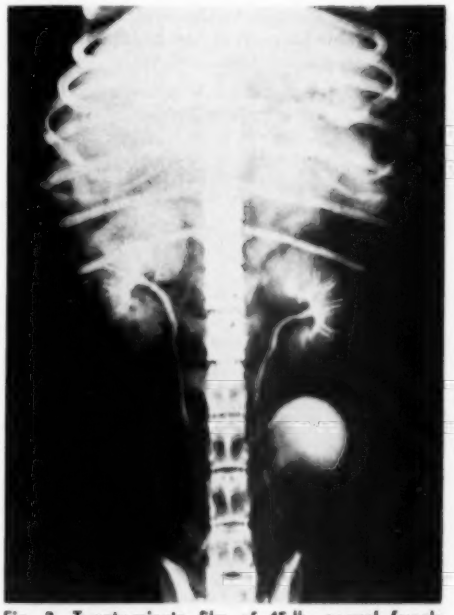

Fig. 2—Twenty-minute film of 45-lb. normal female Collie showing outline of kidneys, renal pelves, ureters, and bladder.

When empty, the bladder contracts into the pelvis completely. It is seldom visible in the ventrodorsal view. As the bladder fills and extends, it enters the abdominal cavity as a large pear-shaped mass often extending to the umbilicus. The applica-

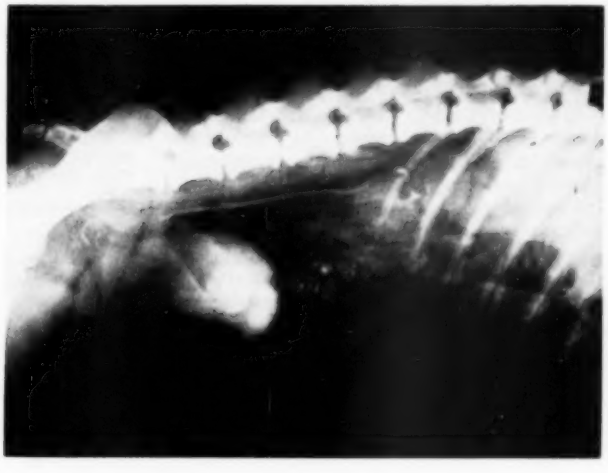

Fig. 3—Thirty-minute film from lateral aspect demonstrating course of ureters and their entry into the bladder.

tion of compression to the ureters may displace the bladder from its normal midline position in the ventrodorsal view.

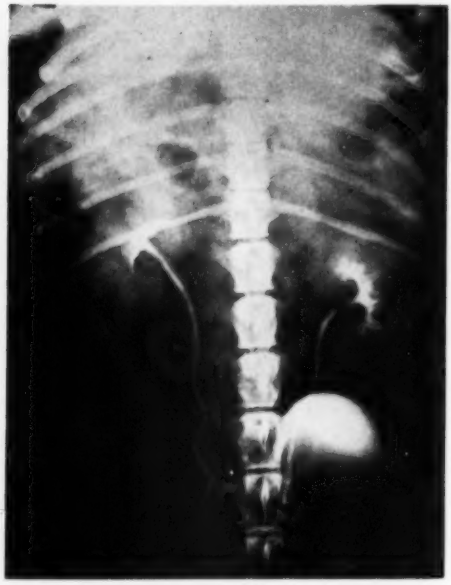

Fig. 4—Thirty-minute film of 65-lb. normal Labrador female showing variation in appearance of renal pelves and tortuosity of ureters. Bladder is displaced from median line by compression.

The kidneys do not appear to function simultaneously or with equal vigor. It is suggested that an examination be completed before the films are interpreted.

CONCLUSIONS

Intravenous pyelography is a useful and practicable aid in visualizing the urinary tract.

Wide variations exist in the normal animal as to position, attitude, and macroscopic structure of the kidneys and ureters when viewed radiographically.

Confirmation of an irregularity in the urinary tract should be based on failure of the dye to appear in any or all of the organs comprising the urinary tract, after a suitable passage of time. Displacement of the organs and/or change in size may also be present.

Maximum concentration of dye occurred and persisted for fifteen to forty minutes after injection in normal animals.

The structure of the renal pelvis in dogs and cats does not appear to allow adequate radiographs to be obtained when a contrast medium of 35 per cent weight/volume concentration is employed. A quality of film approaching that which one might expect with retrograde pyelography can be obtained consistently by using a 70 per cent contrast medium.

In order to be able to interpret the results obtained, careful preparation and exact reproduction of a technique known to produce results in a normal animal must be carried out.

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Reproductive Phenomena in the Chinchilla

The urogenital system of the chinchilla is unique in that separate openings are present for the rectum, uterus, and bladder. The uterine opening is completely sealed except when breeding and for parturition. The female is multiëstrous, the estrous cycle taking about twenty-eight to thirty-five days. The gestation period is approximately 111 days. Most females rebreed the day of birth and their litters range from 1 to 6 with an average of 2 or 3 young. Puberty is reached at 4 to 6 months of age. Normal parturition takes six to eight hours. Dystocia should be relieved by cesarean section.—*The Speculum, Spring, 1953.*

Surgical Relief of Hydrops Amnii

ROBERT E. PIERSON, D.V.M., and
JAMES T. INGRAM, D.V.M.

Saratoga, Wyoming

On Feb. 3, 1953, a call was made to see an aged purebred Aberdeen Angus cow that was developing an enormously enlarged abdomen and was falling off considerably in weight. Hydrops amnii was immediately suspected and was confirmed on rectal palpation. She had been bred by artificial insemination on July 27 so her exact gestation stage was six and one-half months. She was brought to our clinic for surgery.

It seems that little has been written on the surgical relief of hydrops amnii until the two articles published in the AVMA JOURNAL (Oct., 1952, p. 267; Nov., 1952, p. 359). The two-phase method of surgical relief as outlined in the latter article was followed, with certain modifications.

Procedure.—On February 7, the cow was prepared for a routine, left flank, standing laparotomy. Regional anesthesia was obtained by a paralumbar nerve block. An incision 5 inches long was made through the abdominal wall, exposing the uterus which was so distended and tense that it was impossible to tell which was the pregnant horn. An unsuccessful attempt was made to locate the corpus luteum of pregnancy and express it, hoping that this might induce abortion.

A plastic catheter was then introduced deeply into the left horn of the uterus and secured by a purse-string suture. The free end was allowed to hang outside and a few inches below the flank to establish a siphon. The flank incision was then closed and 3 million units of penicillin administered intramuscularly. During the remainder of that day and night fluid drained through the catheter, occasionally stopping only to begin again when the cow altered her position.

The following day, her abdomen being considerably reduced, a left flank cesarean section was done. Anesthesia again was obtained by a paralumbar nerve block. As the operation was started, the cow slipped and fell, so the operation was continued with the cow in a recumbent position. The fetus was removed but, due to their firm attachment, the fetal membranes were left in the uterus. Three 500-mg. aureomycin oblets were placed in the uterus which was then closed with a double row of Lembert sutures. Before suturing the abdominal wall, 200 cc. of merameth solution was poured into the abdominal cavity. Other therapy consisted of 5 cc. of posterior pituitary extract, plus 1 Gm. of terramycin in 1,000 cc. of 5 per cent dextrose solution given intravenously, 5 cc. of posterior pituitary extract with 10 cc. of antihistamine, and 2.5 cc. of ECP given intramuscularly.

Two days later, the cervix had dilated enough to admit two fingers so the membranes were ruptured to allow the escape of more fluid and three uterine capsules were placed in the uterus. By the third day, the cervix had dilated sufficiently to allow introduction of an arm and partial removal of the membranes. On the fourth day, the cervix was still sufficiently open to allow removal of the remainder of the membranes and the placing of two uterine capsules in each horn of the uterus.

The cow's temperature remained normal during the time she was under observation and three weeks later she was making an uneventful recovery.

[In a letter accompanying his manuscript, the author asks: Has anyone had success in expressing the corpus luteum and thereby causing abortion in such a case.—ED.]

Drs. Pierson and Ingram are general practitioners in Saratoga, Wyo.

Eventration of the Cecum in a Horse

A 7-year-old gelding, gored by a cow three hours previously, had one third of the cecum protruding through the wound. The wound was on the right side about 4 inches from the median plane and 5 inches posterior to the costal arch. The cecum was bruised and contaminated from rolling.

The horse was given chloral hydrate and sodium pentobarbital solution intravenously. After cleansing, the eventration was reduced and the wound sutured. The animal was given a single treatment of sulfonamides, intravenously, and 1,500 units of tetanus antitoxin, plus 3,000,000 units of procaine penicillin, intramuscularly. Eleven days later the owner reported that the horse had missed only one meal. Sutures were removed on the fourteenth day.—*Southwest Vet., Spring, 1953.*

A Ruptured Bladder in a Sheep

A 4-year-old, trained bell wether developed a distended abdomen and a moderate depression; he also failed to urinate. Abdominocentesis yielded 3 gallons of urine. Excision of the processus urethrae revealed an occlusion by a calculus the size of a barley grain.

Upon laparotomy, the bladder was found to be so contracted that repair seemed impossible. Therefore, a No. 20 plastic infusion tube was introduced through the urethra until it just entered the bladder. The abdominal incision was then sutured. The free end of the tube was fixed with tape, anterior to the prepuce. Within ten minutes, urine began to drip from the tube slowly but continuously. On the fifth day, the patient was noticed forcing urine past the tube so the latter was removed. Urination soon became normal. Apparently the lacerated bladder had healed.—*Southwestern Vet., Spring, 1953.*

Intestinal Intussusception

A 3-month-old female terrier pup had not eaten well for five days and had started vomiting. A sausage-shaped object could be palpated in the abdomen and a radiograph showed a vague mass with some gas. Upon laparotomy, two intussusceptions of the small intestine were found and were reduced. A cord could be palpated in the intestine and a small mass in the stomach.

Gastrotomy revealed a plastic sausage casing attached to a heavy cord. The casing was too large to pass the pyloric outlet and the cord had apparently stimulated violent intestinal peristalsis, resulting in two intussusceptions. The patient made an uneventful recovery.—*M.S.C. Vet., Winter, 1953.*

Crossbred Beef Calves Prove Superior.—Clemson College researchers compared the weights at birth and at 7 months of age of purebred Aberdeen Angus, Brahman-Angus and Angus-Hereford calves. At birth the Aberdeen Angus averaged 75 lb., the Brahman-Angus 82 lb., and the Angus-Herefords 73 lb. At 7 months, under similar conditions, the Aberdeen Angus weighed 459 lb., the Brahman-Angus 512 lb., and the Angus-Herefords 537 lb. The crossbreds ate more but their increased gains more than made up for the extra cost of feed.—*Univ. of Nevada Agric. Exten. Service.*

Limited Season Increases Calf Crop.—The weaning weight of the total calf crop may be increased 20 per cent if bulls are allowed to range for only about seventy-five days each year. This results in a more uniform calf crop, less calving troubles from short-aged heifers, and usually a better selling price. With such a system, most ranges require 1 bull to each 25 cows. —*U. S. D. A.*

Diagnosing Arterial Embolisms

The majority (80%) of arterial embolisms in man originate from a diseased left side of the heart. The immediate symptoms are a numbness and tingling of the region supplied by the occluded artery. A severe pain soon develops distal to the point of occlusion, with a loss of pulsation, coolness, and blanching.

Paralysis usually develops gradually but it may occur immediately. The occurrence of embolisms is given as follows: femoral artery 55 per cent, iliac artery 17 per cent, brachial artery 12 per cent, popliteal artery 11 per cent, bifurcation of aörta 4 per cent. —*Am. J. Surg., May, 1953.*

Trends in Poultry Breeds

The report on the record of performance (R.O.P.) of officially trapnested birds indicates that in the past fifteen years, the percentage of birds which were Single Combed White Leghorns has dropped from 65.8 to 51.8 per cent. Barred Plymouth Rocks have also dropped from 11.0 to 5.7 per cent. White Plymouth Rocks have held about steady at 10.0 per cent and Single Combed Rhode Island Reds at 11.8 per cent, while New Hampshires have increased from 3.7 to 19.6 per cent. The 365-day average egg production for these trapnested birds last year was White Leghorn, 210 eggs; Rhode Island Reds and Barred Plymouth Rocks, 200 eggs, respectively; New Hampshire Reds, 184 eggs; and White Plymouth Rocks, 178.—*Ann. R.O.P. Summary, U.S.D.A., Feb., 1953.*

Treatment of Range Ewes with Estradiol Cyclopentylpropionate to Control Breeding—A Field Trial

D. A. PRICE, D.V.M., and W. T. HARDY, D.V.M.

Sonora, Texas

MOST OF THE sheep raisers in our area of West Texas follow the practice of having their range ewes lamb during a 45-day period beginning sometime in February or March. Very little lambing occurs after mid-April because screw worm flies are almost certain to have appeared by that time and because the growth of baby lambs is endangered by the approach of dry summer pastures. Considering the gestation period then, most of the local ranchmen turn rams in with the ewe flocks in mid-September and remove them before or during the first week of November. Three to 4 rams are used per 100 ewes and, under such a program, lamb crops of 60 to 90 per cent may be expected.

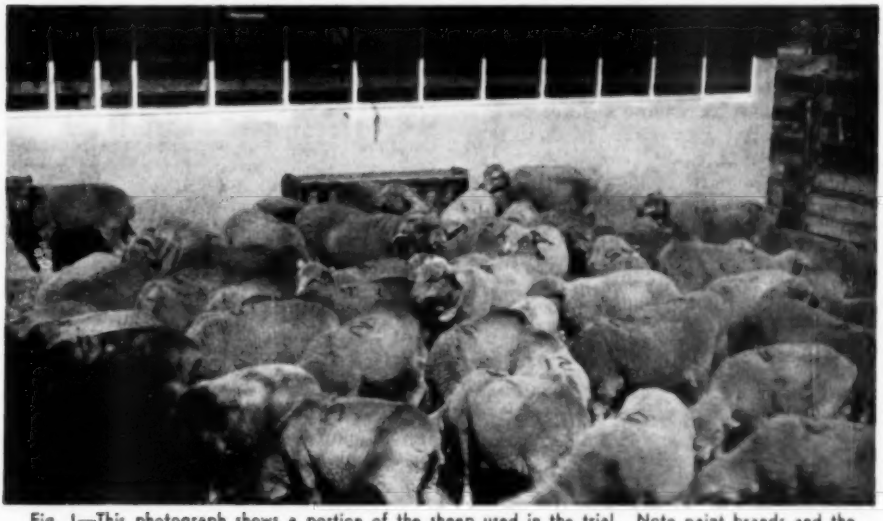


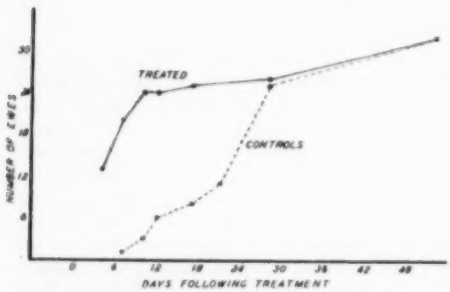
Fig. 1—This photograph shows a portion of the sheep used in the trial. Note paint brands and the marked rumps of a few of the ewes.

A minority of the breeders raise winter lambs in order to take advantage of the higher prices offered for "off-season" lambs. Rams are turned into the ewe flocks in mid-June for a 45-day period, and under this type of program a 50 to 60 per cent lamb crop is considered excellent. The early summer breeding is possible because Rambouillets are by far the predominating breed in the area, and it is an accepted fact that they can be bred at any time of the year, although with greater success in the autumn months. Furthermore, the climate affords such a favorable environment that seasonal impairment of libido and ovine semen quality has not been shown to occur here.

Since readers in the eastern states may wonder about the low lamb-crop percentages quoted above, it seems appropriate to explain that range conditions are far different from those encountered by farm flock sheep. Limited rainfall is often such that southwestern ranges do not produce sufficient forage for optimum breeding conditions. For the same reason, West Texas ranchmen do not select breeding ewes with the twin-

From Substation No. 14, Texas Agricultural Experiment Station, Sonora, Texas.

ning characteristic in mind for, more often than not, the condition of the range will not permit a ewe to rear 2 lambs satisfactorily.



Graph 1—Indication of breeding activity following treatment of ewes with estradiol cyclopentylpropionate.

Our breeders have long wished for a medicinal product which would make possible the production of controlled, uniform lambing or even two lamb crops a year; and those who raise winter lambs have the additional interest in increasing the percentage of the lamb crop. Little wonder, then, that the appearance in early 1952 of estradiol cyclopentylpropionate engendered a new wave of requests from ranchmen for information concerning its efficacy in controlled breeding. Many breeders, not caring to wait for completion of experimental trials, injected ewes with this drug with little regard for the risks or the expense involved. We have first-hand knowledge of several thousand ewes having been treated with this hormone. Generally, the numbers of lambs obtained were disappointing, but since controls had not been used in any case which came to our attention, it was impossible to make much use of the data.

A field trial of the drug under consideration was indicated both for the purpose of helping to formulate an intelligent reply to the inquiries directed to the experiment station and for the purpose of establishing a basis for further investigation should the results indicate the need therefor. The trial described in this paper was begun at a time which coincided with the customary summer breeding season.

EXPERIMENTAL METHODS

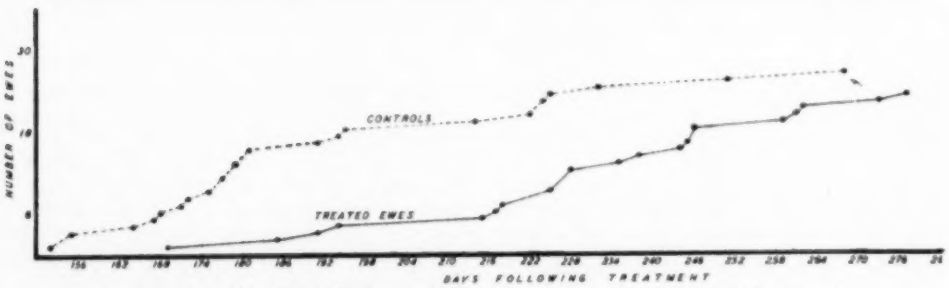
The ewes used in this field trial were 64 purebred Rambouillets ranging in age from 2 to 7 years. They were grazing a 400-acre pasture composed of turf grasses, bunch grasses, and brush, and were receiving no supplemental feed. The 4 rams used were registered 2- to 3-year-old Rambouillets. At the beginning of the trial, on June 16, all of the sheep were in excellent condition. The weather was favorable for sheep breeding, being only comfortably warm during the day and cool at night.

The ewes were divided into two equal groups by random selection and were paint-branded numerically. The ewes in one group were treated with 1 mg. of the drug* given intramuscularly; the other group was untreated and constituted the controls. All ewes were pastured together for the duration of the trial.

The rams were turned into the pasture simultaneously with the ewes and remained with them for 150 consecutive days. Their briskets were painted with a nondrying coloring material which would mark the rumps of any ewes served. The briskets were repainted as often as necessary.

At the beginning of the trial, all sheep in the pasture were gathered at frequent intervals and the brand number recorded for each ewe which

*Supplied through courtesy of the Upjohn Company, Kalamazoo, Mich.



Graph 2—Rate of lambing following treatment of ewes with estradiol cyclopentylpropionate.

appeared to have been served. This required fifty-two days, at which time all ewes had apparently been served at least once. When lambing began, the flock was observed daily and the brand numbers were again recorded for each ewe which had lambed.

In order to conform as nearly as practicable to local husbandry practices, the sheep used in this trial were given no supplemental feed before the breeding period. ("Flushing" of ewes is almost never practiced here and is considered economically questionable.) By mid-January, however, lactating ewes and baby lambs were showing the effects of an inadequate winter pasture, and from that time until March 25 they were given, daily, some legume hay and ½ lb. of range cubes containing 20 per cent protein.

RESULTS

Graph 1 shows in detail the rate at which the two groups of ewes accepted the service of the rams, while graph 2 represents the lambing data. There was no apparent deviation from normal in the sex ratio of lambs in either group.

DISCUSSION

With respect to the breeding activity early in the trial, it is interesting to note that within ten days following treatment, indications were that 75 per cent of the treated ewes had accepted service, as compared with 9.4 per cent of the controls. By the thirtieth day, the two groups were practically equal and by the fifty-second day, all ewes in the trial appeared to have been served. Admittedly, this type of data may not be an entirely accurate indication of breeding activity but is interesting when viewed in the light of lambing data, which provide the true criterion of the efficacy of the drug used.

The most interesting and significant aspect of the lambing data can be realized by visualizing the results in a hypothetical manner; e.g., if the rams had been removed after a 45-day breeding period (which is customary in our locality), then the lines in graph 2 hardly could have extended beyond 200 days, at which time the treated ewes had produced a 12.5 per cent lamb crop compared with 56.25 per cent for the controls. Thus, the controls had produced a normal lamb crop for that time of the year.

It was fortunate that the trial was not conducted on the basis of a 45-day breeding period, for the question as to whether any permanent deleterious effects had occurred in the treated ewes deserved an answer. Referring again to graph 2, the reader will see that although conception in the treated ewes was delayed, their lamb crop compared favorably with that of the controls at the end of the trial; it was presumed, therefore, that no permanent impairment of fertility occurred.

The methods used did not provide for determining whether ovulation occurred as a result of the nonproductive estrous periods in the treated ewes, nor was any attempt made to determine how many estrous periods occurred between the time of treatment and conception. This information would be of much academic interest but was not essential to the purpose of the trial.

In all fairness to the drug under consideration, readers are reminded that the results reported here do not detract from any value it may have as a therapeutic agent. Neither can they be considered as applying to those breeds of sheep having a more pronounced, seasonal anestrous period, without further experimentation.

SUMMARY

A field trial is described wherein Rambouillet range ewes were treated with estradiol cyclopentylpropionate and allowed to breed at pasture for a 150-day period, along with an equal number of controls. Results are shown graphically.

There were indications of induced breeding activity in the treated ewes shortly after treatment; however, the lambing data for the treated ewes did not compare favorably with the data for controls. Had the breeding period been terminated at the end of forty-five days, in accordance with local custom, the treated ewes would have produced a 12.5 per cent lamb crop as compared with 56.25 per cent for the controls.

CONCLUSIONS

The intramuscular injection of 1 mg. of estradiol cyclopentylpropionate did not produce a satisfactory degree of controlled breeding in Rambouillet range ewes under the conditions of the field trial described.

A tight bandage should not be placed on a dog's eye while anesthetized, unless a tube is placed in the trachea. Otherwise, the animal may be strangulated.—*W. G. Magrane, D.V.M., Mishawaka, Ind.*

CLINICAL DATA

The Pathology of Shipping Fever in Feedlot Cattle

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SINCE THE TURN of the century, shipping fever has been a common disease in feedlot cattle throughout the United States. Synonymous terms which have been used in the past are hemorrhagic septicemia, transit fever, stockyard fever, fibrinous pneumonia, and numerous others.

A great deal of confusion and controversy has existed over the hemorrhagic septicemia complex. Modern textbooks on veterinary medicine usually classify hemorrhagic septicemia into various forms such as pneumonic, edematous, acute septicemic, cerebral, and intestinal.

Literature is abundant on investigations into the etiology, epizoötiology, immunology, and therapeutics of hemorrhagic septicemia. Pathological records are incomplete.

Scott,[1] in 1933, listed two diseases which were frequently confused. The first, a spontaneous septicemia either sporadic or enzoötic in nature, had a rapid course and high mortality. Postmortem lesions included pneumonia, acute hemorrhagic gastritis and enteritis, and subcutaneous edema.

The second disease he described as a shipping fever or exposure disease which had a slow onset of one to several days and a course of several weeks. Postmortem lesions were fibrinous pleuropneumonia and catarrhal gastroenteritis.

Pickering,[2] in 1939, tabulated clinical differences between transit fever and hemorrhagic septicemia. He showed that symptoms, environmental conditions, and course differed for the two diseases. True hemorrhagic septicemia was uncommon in his experience.

In 1930, Tweed and Edington[3] described pneumonia in cattle due to *Pasteurella boviseptica*. The bacteriology as well as gross and microscopic pathology of the lungs were reported on 7 cows from several sources. The micropathology of the liver, spleen, kidney, alimentary tract, and lungs was reported on 2 of these animals.

Langham, Thorpe, Ingle, and Sholl,[4] in 1942, reported their observations on the pathology of pneumonia in food-producing animals. Thirty-one cases of bronchopneumonia were reported; 9 were cattle, 12 sheep, and 10 swine.

The same year Thorpe, Shigley, and Farrell[5] reported a characteristic bronchopneumonia in calves associated with calf scours. A hemophilic-like Bacterium was isolated consistently in 28 cases of calf pneumonia.

METHODS AND MATERIALS

Material and data were obtained from the autopsy of 57 Hereford cattle from feedlots in the area surrounding Fort Collins, Colo., and from animals submitted to the veterinary hospital at Colorado A. & M. College for autopsy.

The majority of animals were calves 5 to 8 months of age. All animals had recently been shipped to the feedlot.

A complete autopsy was performed on each animal. Gross pathology was recorded immediately after autopsy. Tissues for sectioning were collected from nasal mucosa, larynx, trachea, lung, parapharyngeal and mediastinal lymph nodes, brain, abomasum, small and large intestine, liver, kidney, and spleen. They were fixed in 10 per cent formalin. Histopathological sections were stained by Nocht's and Pollack's methods.

Sections were examined for degeneration, circulatory changes, inflammation, inclusion bodies, and bacteria.

Following histopathological examination, it was found that all cases could be divided into three groups on the basis of gross and microscopic pathology and clinical history.

Animals showing evidence of a beginning pneumonia were placed in group 1. Those with acute shipping fever showing a typical consolidation of lung tissue with various stages of hepatization and without complications were placed in group 2. Group 3 comprised those cases of long standing which showed resolution or complications such as gangrene, fibrosis, and abscesses.

RESULTS

A summary of gross and histopathological changes is recorded in tables 1 to 3. In all cases, both the number of animals and the percentage showing specific lesions is given. The number and percentage for the incidence of pathology seen is listed under the headings of groups 1, 2, and 3. Total percentage based upon the total

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The assistance and coöperation of Dr. James L. Palotay of Monfort Feed Lots, Inc., Greeley, Colo., and Dr. Rue Jensen of the Department of Pathology and Bacteriology of Colorado A. & M. College, is deeply appreciated.

TABLE 1—Gross Pathology of Shipping Fever

Gross lesions	Group 1 (8 animals) (No.)	(%)	Group 2 (19 animals) (No.)	(%)	Group 3 (30 animals) (No.)	(%)	Total (57 animals) (No.)	(%)
Subcutaneous lesions								
1. hemorrhage	2	25.0	7	36.8	5	16.7	14	24.5
2. edema	..	....	3	15.8	3	10.0	6	10.5
Rhinitis	5	62.5	12	63.2	21	70.0	38	66.6
Sinusitis	..	....	1	5.3	7	23.3	8	12.3
Tracheitis							38	66.6
1. proximal portion	4	50.0	2	10.5	4	13.3	10	17.5
2. distal portion	..	....	3	15.8	....	....	3	5.2
3. entire length	2	25.0	9	47.4	14	46.7	25	43.8
Pharyngitis	1	12.5	1	5.3	1	3.3	3	5.2
Larynx								
1. hemorrhage	2	25.0	4	21.0	8	26.6	14	24.5
2. superficial necrosis	1	12.5	6	31.6	4	13.3	11	19.3
3. diphtheria	1	12.5	....	....	4	13.3	5	8.8
Lung								
1. congestion only	2	25.0	....	....	....	....	2	3.5
2. consolidation-1/3, under	3	37.5	5	26.3	9	30.0	17	29.8
3. consolidation-1/3 to 2/3	3	37.5	13	68.4	17	56.6	33	58.0
4. consolidation-2/3, over	..	....	1	5.3	4	13.3	5	8.8
5. bilateral pneumonia							53	93.0
6. unilateral pneumonia							2	3.5
Pleuritis	5	62.5	19	100	22	73.3	46	80.7
Bronchi (major)								
1. blood clots	4	50.0	5	26.3	8	26.6	17	29.8
2. pus	..	....	....	....	2	6.7	2	3.5
Thymus								
1. hemorrhages	1	12.5	6	31.6	9	30.0	16	28.0
Heart								
1. hemorrhages	8	100	14	73.7	21	70.0	43	75.4
Pericardium								
1. hemorrhages	2	25.0	9	47.4	14	46.7	25	43.8
2. pericarditis	2	25.0	2	10.5	1	3.3	5	8.8
Mediastinal lymph nodes								
1. hemorrhages	2	25.0	3	15.8	2	6.7	7	12.3
2. serohemorrhagic	..	....	7	36.8	14	46.7	21	37.0
3. serous	3	37.5	9	47.4	3	10.0	15	26.3
Parapharyngeal lymph nodes								
1. hemorrhagic	2	25.0	3	15.8	2	6.7	7	12.3
2. serohemorrhagic	1	12.5	4	21.0	15	50.0	20	35.0
3. serous	2	25.0	6	31.6	3	10.0	11	19.3
Peritoneal cavity								
1. ascites	..	....	4	21.0	2	6.7	6	10.5
2. peritonitis	1	12.5	....	....	1	3.3	2	3.5
3. hemorrhages	2	25.0	1	5.3	2	6.7	5	8.8
Liver								
1. congested	3	37.5	8	42.1	17	56.7	28	49.1
2. abscesses	2	25.0	....	....	....	....	2	3.5
Kidney								
1. congested	3	37.5	....	....	2	6.7	5	8.8
2. hemorrhages	1	12.5	....	....	3	10.0	4	7.0
3. infarcts	1	12.5	4	21.0	2	6.7	7	12.3
4. calculi	1	12.5	....	....	1	3.3	2	3.5
Brain								
1. congestion	1	12.5	9	47.4	3	10.0	13	22.8
2. hemorrhages	1	12.5	4	21.0	1	3.3	6	10.5
3. meningitis	..	....	....	....	1	3.3	1	1.7
Spleen								
1. hemorrhages	1	12.5	2	10.5	5	16.7	8	14.0
Abomasum								
1. abomasitis	5	62.5	18	94.7	24	80.0	47	82.5
2. ulcers	4	50.0	4	21.0	8	26.7	16	28.0
Small intestine								
1. enteritis	..	....	....	....	....	....	33	58.0
duodenum	1	12.5	4	21.0	6	20.0	11	19.3
jejunum	..	....	....	....	1	3.3	1	1.7
ileum	..	....	....	....	1	3.3	1	1.7
duodenum and jejunum	..	....	....	....	2	6.7	2	3.5
jejunum and ileum	1	12.5	....	....	2	6.7	3	5.2
entire	..	....	9	47.4	6	20.0	15	26.3
2. hemorrhage into lumen	3	37.5	3	15.8	4	13.3	10	17.5
Large intestine								
1. colitis	1	12.5	6	31.6	8	26.7	15	26.3
2. hemorrhage into lumen	4	50.0	2	10.5	4	13.3	10	17.5

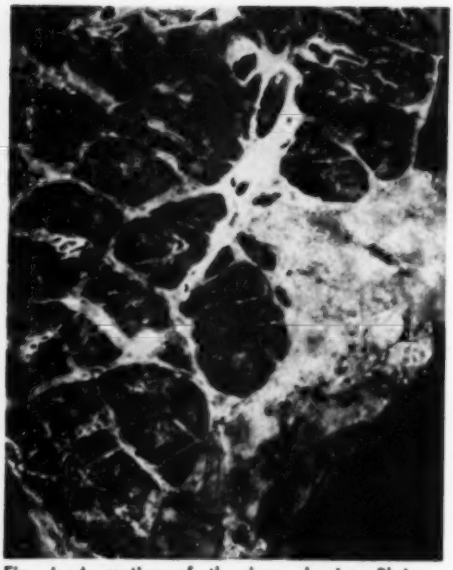

Fig. 1—A section of the lung showing fibrinous pneumonia, fibrinous pleuritis, and thickening of the interlobular septums with fibrin.

number of animals in all three groups is also given.

Table 1 shows gross lesions recorded at the time of autopsy. Table 2 shows the histopathological changes seen in the lungs, and table 3 shows the histopathological changes in all other organs from which tissues were taken for examination.

No virus inclusion bodies were seen in any of the tissues examined.

DISCUSSION

The gross and microscopic lesions in several cases revealed a marked discrepancy in the total occurrence of the lesions. These differences were due to two primary factors: (1) Gross examination revealed less pathology than microscopic examination of the same organ; (2) percentages shown for the incidence of histopathological changes are lower than for those shown on gross examination, due to the fact that tissues were not saved from all animals autopsied.

It is notable that of the 57 animals autopsied, 53 showed bilateral pneumonia, 2 showed unilateral pneumonia, and two showed only a severe congestion in the apical and cardiac lobes.

Observations indicate that shipping fever begins with a severe congestion of the lung followed by hemorrhage and an outpouring of fibrinous exudate into the alveoli. This is accompanied by atelectasis and emphysema in the portions of the lung adjacent to the pneumonic areas. A severe bronchitis and bronchiolitis with hemorrhage into

Fig. 2—Costal surface of the left lung showing acute fibrinous pneumonia.

Fig. 3—Transverse section of the lung showing acute fibrinous pneumonia.

the lumen develops simultaneously. There is no true bronchopneumonia. Fibrin and some edema are seen in the interlobular septums.

The lymphatics which drain the lungs become thrombosed early in the course of the disease. The stage of congestion and hemorrhage is seen at the spreading border of the infection. Areas of red hepatization interspersed with areas showing grey hepatization make up the consolidated portion of the lung. As the disease progresses, more of the lung becomes involved until the stages of red and grey hepatization and hemorrhage may be seen concurrently in the same lung.

In the areas of grey hepatization, the leukocytes are increased in number and consist of both polymorphonuclear leukocytes and mononuclear macrophages. The red cells have been laked or phagocytosed and are no longer identifiable.

Later, the areas of grey hepatization increase in extent and, if the pneumonia remains uncomplicated, resolution begins. The tissues become more acid, thus stimulating the entrance and activity of the mononuclear macrophages in the area. Many of the macrophages coalesce to form giant cells. The contents of the alveoli are removed by dissolution, phagocytosis, and expulsion.

Not all cases are typical. In many instances, the blood vessels become thrombosed and infarctions develop.

Delayed recovery results in failure to resolve the fibrinous exudate which becomes organized into permanent fibrous connective tissue. Failure to destroy bacteria in the alveoli results in abscesses and gangrene. Bacterial invasion of the blood stream and lymphatics may result in septicemia.

Accompanying the pathological changes in the lungs is a severe inflammation of the upper respiratory passages. Rhinitis, laryngitis, and tracheitis are commonly seen. Sinusitis apparently appears as a secondary factor since its incidence was higher in cases of long standing.

Hemorrhages on the heart, thymus, spleen, pericardium, peritoneum, kidneys, and in the subcutaneous tissues may be the result of toxemia or septicemia. The same applies for congestion, fatty changes, and central necrosis in the liver, and nephrosis, congestion, and hemorrhage as observed in the kidneys.

TABLE 2—Histopathology of the Lung in Shipping Fever

Histopathological changes	Group 1 (7 animals)		Group 2 (18 animals)		Group 3 (23 animals)		Percentage of total (48 animals)
	(No.)	(%)	(No.)	(%)	(No.)	(%)	
Alveoli							
red hepatization	7	100	18	100	21	91.3	95.8
grey hepatization	3	42.8	18	100	23	100	91.7
hemorrhage	6	85.7	18	100	23	100	97.9
resolution	--	---	1	5.5	15	65.2	33.3
atelectasis	7	100	11	61.1	15	65.2	68.7
emphysema	7	100	16	88.9	19	82.6	87.5
organization of fibrin	--	---	---	---	11	47.8	22.9
infarcts and gangrene	--	---	5	27.8	12	52.2	35.4
abscesses	--	---	---	---	10	43.5	20.8
Septums and interstitial tissue							
fibrinous	6	85.7	18	100	23	100	97.9
fibrosis	--	---	---	---	5	21.7	10.4
edema	5	71.4	18	100	15	73.9	83.3
emphysema	5	71.4	8	44.4	14	60.8	56.3
thrombosed lymphatics	3	42.8	18	100	18	78.3	81.3
Bronchial epithelium							
desquamation	3	42.8	14	77.8	23	100	83.3
swollen	6	85.7	15	83.3	10	43.5	64.6
Bronchitis and bronchiolitis							
fibrinous	4	57.1	18	100	20	87.0	87.5
purulent	3	42.8	14	77.8	21	91.3	79.2
hemorrhagic	6	85.7	16	88.9	18	78.3	83.3
Blood vessels							
congestion	7	100	18	100	23	100	100
thrombosis	1	14.3	9	50.0	12	52.2	45.8

TABLE 3—Histopathology of Shipping Fever

Organ	Histopathology	Group 1 (No.)	Group 1 (%)	Group 2 (No.)	Group 2 (%)	Group 3 (No.)	Group 3 (%)	Total (%)
Kidney								
(39 animals)		(6 animals)		(15 animals)		(18 animals)		
	congestion	4	66.6	13	86.6	17	94.4	87.2
	hemorrhages	5	83.3	11	73.3	16	88.9	82.0
	nephrosis	6	100	6	40.0	10	55.5	56.4
	infarcts	..	....	1	6.6	1	5.5	5.1
Liver								
(39 animals)		(6 animals)		(16 animals)		(17 animals)		
	congestion	5	83.3	15	93.7	14	82.4	87.2
	fatty metamorphosis	4	66.6	16	100	17	100	94.9
	central necrosis	5	83.3	14	87.5	17	100	92.3
	abscesses	1	16.6	1	6.3	2	11.8	10.3
Spleen								
(45 animals)		(6 animals)		(16 animals)		(23 animals)		
	congestion	5	83.3	15	93.7	18	78.3	84.4
Parapharyngeal lymph nodes								
(42 animals)		(5 animals)		(14 animals)		(23 animals)		
	congestion	5	100	13	92.8	17	73.9	83.3
	serous	5	100	13	92.8	21	91.3	92.8
	hemorrhagic	3	60.0	10	71.4	14	60.8	64.3
Mediastinal lymph nodes								
(39 animals)		(3 animals)		(15 animals)		(21 animals)		
	congestion	3	100	14	93.3	19	90.5	92.3
	serous	3	100	13	86.6	19	90.5	89.7
	hemorrhagic	1	33.3	11	73.3	12	57.1	61.5
Brain								
(36 animals)		(5 animals)		(13 animals)		(18 animals)		
	congestion	1	20.0	8	61.5	6	33.3	41.6
	hemorrhages	..	....	2	15.4	2	11.1	11.1
	meningitis	..	....	....	....	1	5.5	2.7
Nasal mucosa								
(33 animals)		(5 animals)		(11 animals)		(17 animals)		
	congestion	5	100	11	100	14	82.4	90.0
	hemorrhage in submucosa	3	60.0	11	100	13	76.5	81.8
	edema	2	40.0	8	72.7	10	58.8	60.6
	thrombosis	1	20.0	8	72.7	2	11.8	33.3
	catarrhal	4	80.0	9	81.8	12	70.6	75.8
Larynx								
(37 animals)		(5 animals)		(12 animals)		(20 animals)		
	congestion	4	80.0	11	91.6	17	85.0	86.5
	hemorrhage	2	40.0	8	66.6	9	45.0	51.4
	edema	2	40.0	7	58.3	9	45.0	48.6
	superficial necrosis	1	20.0	4	33.3	5	25.0	27.0
	diphtheria	1	20.0	....	....	5	25.0	16.2
Trachea								
(38 animals)		(6 animals)		(14 animals)		(18 animals)		
	congestion	6	100	14	100	16	88.9	94.7
	hemorrhage in submucosa	4	66.6	8	57.0	11	61.1	60.5
	edema	6	100	11	78.6	11	61.1	73.7
	catarrhal	4	66.6	8	57.0	12	66.6	63.2
Small intestine								
(31 animals)		(5 animals)		(12 animals)		(14 animals)		
	congestion	5	100	11	91.6	13	92.8	93.5
	submucosal hemorrhage	3	60.0	10	83.3	11	78.6	77.4
	catarrhal	5	100	12	100	13	92.8	96.8
	hemorrhagic	2	40.0	4	33.3	7	50.0	41.9
	purulent	..	....	2	16.6	4	28.6	19.4
Large intestine								
(24 animals)		(3 animals)		(9 animals)		(12 animals)		
	congestion	3	100	9	100	11	91.6	95.8
	submucosal hemorrhage	2	66.6	2	22.2	5	41.6	37.5
	catarrhal	2	66.6	8	88.8	11	91.6	87.5
	hemorrhagic	2	66.6	4	44.4	4	33.3	41.7
	purulent	1	33.3	....	....	1	8.3	8.3
Abomasum								
(25 animals)		(2 animals)		(10 animals)		(13 animals)		
	congestion	2	100	10	100	12	92.3	96.0
	edema	2	100	8	80.0	11	84.6	84.0
	submucosal hemorrhage	..	....	3	30.0	6	46.2	36.0
	catarrhal	1	50.0	10	100	11	84.6	88.0
	hemorrhagic	1	50.0	5	50.0	8	61.5	56.0
	ulcers	1	50.0	2	20.0	3	23.0	24.0

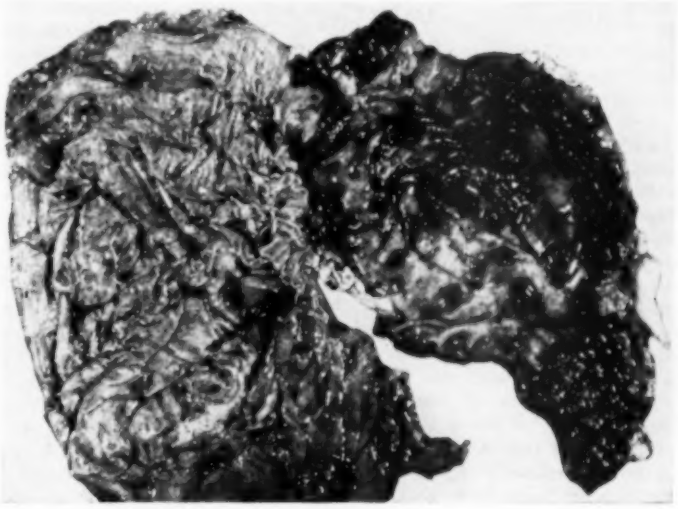

Fig. 4—Abomasum from an animal with shipping fever, showing acute hemorrhagic gastritis and ulcers.

SUMMARY

Fifty-seven feedlot cattle which died of shipping fever were examined for gross and histopathological changes. Tables 1 to 3 show the incidence of gross and microscopic lesions.

Other observations were:

1) Of the lungs examined, 93 per cent showed bilateral pneumonia, while only 3.5 per cent presented a unilateral pneumonia.

2) Fifty-eight per cent of the lungs showed consolidation in the lower one-third to two-thirds, 29.8 per cent showed consolidation involving one-third, and 8.8 per cent showed consolidation of over two-thirds of the lung tissue.

3) A total of 29.8 per cent showed hemorrhage into the major bronchi on gross examination. Histopathologically, hemorrhage into the bronchi and bronchioles totaled 83.3 per cent.

4) Observations indicated that shipping fever begins with a severe congestion of the lung followed by hemorrhage and an outpouring of fibrinous exudate into the alveoli. This is accompanied by atelectasis and emphysema in the portions of the lungs adjacent to the pneumonia areas. A severe bronchitis and bronchiolitis with hemorrhage into the lumen of the bronchi and bronchioles occurs simultaneously.

5) In contrast with human lobar pneumonia, fibrinous pneumonia in cattle presents not only the classical stages of hepatization but a severe bronchitis as well.

6) Of the acute uncomplicated cases of fibrinous pneumonia, 100 per cent showed thrombosis of the lymph vessels draining the lungs.

7) Thrombosis of the vascular system was common, leading to infarcted areas and gangrene.

8) Cases of shipping fever of long duration showed many secondary complications such as gangrene, abscesses, and fibrosis.

9) Changes in organs and tissues outside of the respiratory system are probably a result of toxemia or septicemia.

10) No virus inclusion bodies were seen in any of the tissues examined.

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Pasteurelloses in Dairy Cattle

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For many years the disease of hemorrhagic septicemia, shipping fever, or stockyard pneumonia has been described in this country. *Pasteurella boviseptica* is commonly believed to be the causative organism. Relatively little research has been done on this disease in recent years, probably due to the fact that the disease can not be readily reproduced in experimental cattle. The organism, *P. boviseptica*, is commonly found on the culturing of pneumonic lungs of animals dying with the disease. This organism may also be found on the respiratory mucous membrane in normal cattle. In recent years, these well-known facts have given rise to speculation as to whether the causative agent may not be a virus with a secondary infection with Pasteurella organisms. Other factors to be considered in the etiology are lowered resistance from fatigue, irregular or inadequate feeding, and other management practices.

It is possible that enzoötic pneumonia in calves might be related to this disease but it is doubtful, since herd outbreaks have frequently been observed with no calves affected and, conversely, outbreaks of enzoötic pneumonia in calves have been observed without any evidence of spread to the adult cattle. The use of hemorrhagic septicemia bacterin or antiserum has not proved successful in controlling the enzootics of pneumonia that occur in the young.

Shipping fever in dairy cattle apparently is the same disease as in beef cattle. Any differences in the course may be because outbreaks of this disease in dairy cattle are usually observed, diagnosed, and treated earlier and easier than in beef cattle.

The most common form of shipping fever treated in dairy cattle is characterized by pneumonic symptoms. However, the septicemic form may be the most frequent since, in most outbreaks of the pneumonic form, many cattle in the herd will develop an elevated temperature, indicating infection, but no further symptoms are observed, even when no treatment is given.

In the northeastern part of the United States, shipping fever in cattle is a disease occurring primarily during the winter and spring—from November through May. It is usually introduced into a herd by the purchase of outside animals that have either passed through stockyards or community sales and carried the infection into the susceptible herd. Occasionally, the infection may be brought from fairs or exhibitions. Because dairy cattle in the northeast are closely observed, veterinarians usually are called early in an outbreak of this disease. Therefore, treatment is usually successful. A review of the records of the past six years of the ambulatory clinic of the New York State Veterinary College showed that approximately 320 cattle were treated for shipping fever, with a death loss of approximately 3 per cent. This loss would probably be less than ½ of 1 per cent if cases complicated by metritis, mastitis, debility, and neglect were eliminated. The favorable response to treatment in late years is probably another reason why more research on the causative factors has not been attempted.

The treatment is most successful when instituted before the pneumonic symptoms of rapid breathing, dyspnea, cough, and anorexia have progressed to an advanced state. Sulfonamides alone are satisfactory, with sulfamerazine or sulfamethazine being preferred at a dose rate of approximately 1 gr. per pound of body weight daily and continued for three to four days. Frequently, initial treatment will consist of administering one of these sulfonamides intravenously with the subsequent follow-up, consisting of sulfathiazole administered orally three to four times daily at the same dosage rates. This latter procedure is more economical for the average commercial dairyman. The use of antibiotics in the treatment of this disease has also been satisfactory. Penicillin is used most commonly and doses of 3 million units daily for three to four doses seem sufficient for the average 500- to 1,000-lb. animal. Some report more satisfactory and prompt results with the use of streptomycin, 1 to 2 Gm. twice daily, or 3 to 5 Gm. once daily. The broad-spectrum antibiotics such as terramycin or aureomycin are also satisfactory in the same or slightly lower doses once

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daily. These latter antibiotics because of their expense have not been as widely used. Since the secondary complications of pneumonia are apparently due to the Pasteurella organism which is gram-negative, streptomycin, aureomycin, and terramycin should be more effective than penicillin. Many veterinarians use a combination of antibiotics and sulfonamides in the successful treatment of this condition.

The use of bacterins in an outbreak of this disease is not generally advocated or practiced. In recent years, hemorrhagic septicemia antiserum has not been given to animals in an exposed herd or where an outbreak has occurred or is starting. Only cattle that show dyspnea and anorexia are treated, and they are given sulfonamides or antibiotics. The results obtained are as satisfactory and less expensive than formerly when serum was used on all exposed animals. About the only occasion for which hemorrhagic septicemia antiserum is used is for prompt passive immunization just prior to shipment. The use of bacterin is limited to the vaccination of herds where shipping fever has been a more or less yearly problem, such as cattle dealers' herds or the few beef cattle herds in this area, into which feeder cattle are introduced. This vaccination is done in the fall and is fairly satisfactory although occasional breaks, where vaccinated animals will come down with the disease, are not uncommon.

In reviewing recent literature, one is impressed with the lack of concrete information, especially as to the factors concerned with the etiology and the prophylaxis of the disease. A wide range of treatments appear to be successful.

Pasteurellosis involving the udder has also been reported in cattle, but in such few numbers that they chiefly emphasize the rarity of bovine mastitis due to Pasteurella.

The Role of Pasteurella in Sheep Diseases

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As in other species of animals, organisms of the genus Pasteurella are frequently recovered from the tissues of sheep at autopsy, particularly from the respiratory tract. Also, as is the case with other species, there has probably been some misinterpretation of the role of this organism in ovine pathology. The term pasteurellosis is generally used as referring to the condition which for many years was known as hemorrhagic septicemia, and too frequently that diagnosis still is made when Pasteurella is found at autopsy. It is probably true that a septicemic form of pasteurellosis does occur, but this is a relatively infrequent form in sheep as in other animals.

REVIEW OF LITERATURE

The literature referring to pasteurellosis in sheep is not extensive so a brief survey without much detail should suffice.

Referring first to general discussions, Hutyra and Marek[14] say "Pasteurellosis in sheep is characterized in acute cases by septicemic symptoms, in subacute and chronic cases by symptoms of croupous-necrotic pneumonia". They also state that "In all probability, pasteurellosis of sheep is a comparatively uncommon disease, if . . . only cases . . . in which the primary role of Pasteurella is established beyond doubt" are so designated.

Newsom,[15] in his book "Sheep Diseases," refers to Pasteurella infections in sheep under the headings of pasteurellosis, pneumonia, and mastitis. He makes pasteurellosis synonymous with hemorrhagic septicemia and shipping fever, and describes it as an acute disease characterized by high fever and extensive hemorrhages, with later pneumonia. He states, however, that in many such outbreaks no Pasteurella can be isolated, and suggests that the primary etiological agent may possibly be a virus. He states that Pasteurella is usually the cause of pneumonia in sheep and also has been incriminated as a causative organism in mastitis.

Belschner,[1] of Australia, in his "Sheep Management and Diseases" does not mention pasteurellosis but states that a specific pleuropneumonia has been recognized in Australia as due to infection with *Pasteurella multocida*.

Oppermann,[21] in "Lehrbuck der Krankheiten des Schafes," discusses pasteurellosis under the heading "Hämorrhagische Septikämie der Schafe." He describes the acute septicemic form, characterized by hemorrhages, and the subacute form in which pneumonia predominates. He recognizes that in some cases the Pasteurella infection may be secondary.

In the past forty years, there have been a number of reports of disease conditions in sheep as-

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sociated with organisms of the genus Pasteurella. In the United States particularly, pasteurellosis has been noted in the form of shipping fever of sheep. Ward and Beebe,[20] in 1911, Hoskins,[12] in 1919, Glover, Newsom, and Alkire,[10] in 1919, Newsom and Cross,[19] in 1923, Hadley,[11] in 1924, Detwiler,[7] in 1931, and Miller[16] in 1940, all reported outbreaks in lambs which had been shipped from the range to feedlots.

Newsom and Cross[19] give an account of an apparently typical outbreak of the shipping fever form of pasteurellosis, with the results of bacteriological investigation. In this instance, there was a loss of 116 of 3,000 lambs within eighteen days after shipping. Autopsies were performed on many, the majority of which showed pneumonia, but in some only subserous and submucous hemorrhages occurred. Of 34 rabbits inoculated intraperitoneally with lung or spleen tissue from 34 sheep, 32 died within twenty-four hours, and in every case a Pasteurella was isolated from the heart of the rabbit.

Spray,[23] in 1923, reported a bacteriological study of pneumonia in lambs found at slaughter. Pasteurella was frequently isolated from these cases.

Marsh,[15] in 1923, and Creech and Gochenour,[6] in 1936, reported isolation of Pasteurella from the lungs of sheep affected with "chronic progressive pneumonia." Marsh isolated Pasteurella from 16 of 25 sets of such lungs examined.

In 1939, Rosenbusch and Merchant[21] published "A Study of the Hemorrhagic Septicemia Pasteurellae," which included 18 strains from sheep.

In England, Montgomerie, Bosworth, and Glover[17] made a bacteriological investigation of several outbreaks of pneumonia in sheep. Pasteurella was isolated from 18 of 22 lungs studied. However, these cultures were ***not*** pathogenic for experimental sheep, and the authors concluded that Pasteurella probably was not the primary agent. Campbell, Campbell, and Dromey[4] isolated Pasteurella from rams which died of pneumonia.

In Iceland, Dungal[9] described acute pneumonia occurring in sheep during the winter when they were housed. He found Pasteurella which was pathogenic for experimental sheep by intratracheal injection.

Apparently, Pasteurella infection has been rarely recognized in Australian sheep. Except for Belschner's book,[1] the only reference found is a report by Beveridge[2] who isolated Pasteurella from the lungs and liver of 2 lambs.

In South Africa, Henning and Brown[12] reported an outbreak. Pasteurella cultures from the lungs were pathogenic for experimental sheep.

Curasson and Didier[5] worked with pasteurellosis in sheep in the French Sudan.

Sikkut[24] described an outbreak in Estonia, in which 50 per cent of lambs 1 to 2 months old died. Cultures of Pasteurella were obtained from the heart blood and lungs.

Several Japanese workers have reported Pasteurella infections in sheep. One of them, Ochi,[20] made a bacteriological study of the organisms isolated from sheep.

In Switzerland, Dolder and Leuenberger[8] described an outbreak and recovered Pasteurella from the lung, liver, and spleen. They made a diagnosis of septicemic pasteurellosis, but stated that the disease did not correspond to the classical hemorrhagic septicemia.

OBSERVATIONS AT THE MONTANA VETERINARY RESEARCH LABORATORY

At the Montana Veterinary Research Laboratory, we recognize *Pasteurella multocida* as a frequent cause of pneumonic lesions in sheep. We have on record only one instance where there was death loss in a flock of sheep, with a diagnosis of septicemic pasteurellosis, without pneumonia. The diagnosis was based on the autopsy and bacteriological examination of 1 animal. The autopsy showed congested lungs, subcutaneous hemorrhages, petechiae on the epicardium, petechiae in the mucosa of the intestines, hemorrhagic lymph nodes, many necrotic foci in the liver, and soft kidneys. The heart blood produced pure cultures of Pasteurella.

With the exception of this case, *P. multocida* infection in sheep has been in the form of either primary or secondary pneumonia. In this area, no large numbers of feeder lambs are received after long shipment. A septicemic form of pasteurellosis may occur under those conditions.

Primary Pasteurella pneumonia occurs principally in lambs within the first month of life and causes the loss of considerable numbers in Montana. This has been recognized for the past forty years. During the 1952 and 1953 lambing seasons, all lambs dying in a lamb drop from 2,000 ewes at the Montana Experiment Station were brought to the laboratory and subjected to autopsy. Death from primary pneumonia was diagnosed in 66 of 361 lambs in 1952 and in 92 of 533 lambs in 1953. The lungs of 27 of the 1953 lambs were cultured, and in 20 cases Pasteurella was the predominant organism. It is considered that nearly all of the pneumonia cases were caused by Pasteurella infection, as they showed the characteristic gross pathology.

Secondary Pasteurella infection of the lungs is frequent in sheep. In the review of literature, it was noted that Marsh reported finding Pasteurella quite constantly present in the lungs of cases of progres-

sive pneumonia. In addition to the bacteriological examinations reported in that article, we have unpublished records of cultures from 73 cases of progressive pneumonia. Pasteurella was isolated from the lungs of 49, from the heart blood of 6, and from the thoracic lymph nodes of 5. In this disease, Pasteurella is definitely *not* involved as a primary etiological factor.

In sheep of all ages, the characteristic Pasteurella pneumonia is frequently a secondary infection, while the primary cause of death is something else. Many times a diagnosis of pasteurellosis is based on finding Pasteurella organisms in lung specimens, whereas the actual cause of the disease may have been necrobacillosis from umbilical infection, enterotoxemia, intestinal parasites, or some other condition. Apparently, the sheep lung is quite susceptible to invasion by Pasteurella.

We have on several occasions recovered Pasteurella from pneumonic lungs of the Rocky Mountain Bighorn sheep, usually in conjunction with *Corynebacterium pyogenes*, in cases of lungworm infestation. We have also found what we considered a primary Pasteurella pneumonia in Bighorn lambs, with isolation of the organism from the heart blood.

PASTEURELLA IN NORMAL LUNGS

The question of the source of the organism in respiratory infections has been frequently discussed, there being some evidence that portions of the respiratory tract may be its normal habitat. In sheep, Pasteurella is rarely found in normal lungs. Newsom and Cross[16] report negative findings in bronchial scrapings from 91 of 92 normal slaughter sheep, and Marsh[15] reported negative findings in 14 normal lungs in one series, but found Pasteurella in two of five apparently normal lungs from a flock where progressive pneumonia existed. Bosworth and Lovell[3] made swabs from the nasal cavities of 100 normal sheep and from the lower trachea of 84, recovering Pasteurella from 40 noses and from seven tracheas. These findings indicate that Pasteurella may be frequently present in the upper respiratory passages of normal sheep, but not in the lungs.

OTHER PASTEURELLA INFECTIONS

Pasteurella infections in sheep not of the respiratory type include: (*a*) tularemia, caused by infection with *Pasteurella tularensis*, which has been reported several times as a result of infestation with infected ticks; and (*b*) a specific mastitis caused by infection of the udder with *Pasteurella mastitidis*. This acute mastitis, described by Marsh[26] in 1932, is the cause of serious losses in the western United States, and has been reported from several European countries. The incidence in infected range bands is about 3 to 4 per cent, with about a 15 per cent mortality. The infection is by way of the teat canal, but in some cases it becomes generalized and positive blood cultures may be obtained. The organisms may produce miliary foci throughout the lung, but not the type of pneumonia characteristic of *P. multocida*.

SUMMARY

The available information on Pasteurella infections in sheep indicates that a condition corresponding to the classical description of hemorrhagic septicemia has been seen only rarely and, when observed, there has been doubt as to whether Pasteurella was the primary etiological agent.

Pneumonia in which Pasteurella is involved, either as a primary or secondary invader, is frequently seen in sheep. Primary Pasteurella pneumonia is probably not common in mature sheep, but is the cause of a considerable loss in young lambs. Pasteurella pneumonia, either primary or secondary, is probably the principal cause of death in shipping fever of sheep.

Other Pasteurella infections in sheep are tularemia, caused by *Pasteurella tularensis*, and mastitis, caused by *Pasteurella mastitidis*.

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Pasteurellosis in Swine

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Pasteurellosis is a specific infectious disease caused by the microörganism, *Pasteurella multocida.* Swine plague and hemorrhagic septicemia are other names which have been used for this disease.

The name pasteurellosis, and the idea of employing it to designate the diseases in animals caused by organisms of the genus Pasteurella, was proposed by Lignieres more than fifty years ago but did not receive very general acceptance until comparatively recent times.

In swine, pasteurellosis occurs in two general forms; as a disease of the lungs and as an acute septicemic disease. However, its occurrence as a primary disease in either form is not common and some question the evidence of pasteurellosis in swine as a disease *sui generis.* They hold that the damage produced by *P. multocida* is secondary to some other primary cause. For example, the pectoral form of pasteurellosis occurs in association with hog cholera and frequently it is the terminal disease in fatal cases of swine influenza. There is much to support this view because it is quite the usual experience to find hog cholera, swine influenza, swine erysipelas, or infectious enteritis somewhere in the picture when this disease is present. Moreover, many different workers report the isolation of *P. multocida* from the lungs of normal swine. Thus, it is postulated that the activities of some other infectious agent set up the conditions in the pig which favor the development of the Pasteurella organisms.

Be this as it may, we have on several occasions, over the past thirty years, observed swine that were sick and dying from a disease which, from clinical and laboratory study, caused us to conclude that the condition was pasteurellosis occurring as a primary disease. This has occurred

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with both the pectoral and septicemic forms of the disease.

Pasteurellosis as a primary disease in swine occurs sporadically and enzoötically. A single pig or several pigs of a drove may be affected within a relatively short time—two to three days. The mortality is variable. It may be as low as 1 or 2 per cent or as high as 60 per cent of the drove. There is no particular age when the pigs seem to be more susceptible to the infection, although it is probably seen most frequently in the "growing-fattening" period.

Dyspnea is a prominent clinical symptom of the pectoral form of pasteurellosis, the severity usually increasing with the progress of the disease until a markedly labored breathing occurs. A cough is prominent and the temperature is elevated to about 105 F. A watery discharge from the eyes and a mucopurulent discharge from the nose are relatively common. Early in the course of the disease pigs will take food sparingly but later they apparently have no desire for it. Emaciation and extreme physical weakness are common in the later stages. The course of the disease is variable, ranging from six to twenty days and more in some instances.

The gross postmortem findings are largely confined to the lungs and adnexa. The lungs of a pig that dies early in the course of the disease usually shows scattered areas of consolidation throughout the parenchyma. Some of these areas are reddened and others are a grayish red. Many small necrotic areas may also be observed. In later stages, an entire lobe or lobes of the lung are involved, representing a coalescence of the isolated areas. Another tissue alteration that occurs frequently in this disease is excessive fluid in the interlobular spaces. The pleura is often covered with a fibrinous exudate and adhesions between the parietal and visceral layers of the pleura are common. The lymph nodes in the thoracic cavity are usually swollen and hemorrhagic. There are no lesions of sufficient importance in other parts of the body to be included as characteristic of pasteurellosis in its pectoral form.

The septicemic form of pasteurellosis is characterized clinically by a sudden onset, a marked physical weakness with concomitant incoördination, and fever. The temperature increases to about 105 to 106 F. The affected pigs manifest a depressed general attitude and show no desire for food. The clinical course is usually short, ending in death within ten to twenty hours of its onset. The postmortem findings in this form of pasteurellosis are chiefly hemorrhages. Petechia and/or ecchymoses of the mucous and serous membranes are usually seen. Similar hemorrhagic lesions in the pericardium, endocardium, and sometimes in the skin are also frequently seen. The lungs in many of these cases are heavy from fluids that collect in the tissue spaces, alveoli, and bronchioles.

In the treatment of pasteurellosis in swine, penicillin or streptomycin seem to have a definite place. Also, some cases respond favorably to the administration of sulfamethazine and some are benefited from intramuscular injection of Pasteurella antiserum. The affected pigs should be protected against undue exposure to unfavorable and changeable climatic conditions. Likewise, it is always good practice to maintain clean and hygienic surroundings for the animals.

Blood Cytology of Shipping Fever in Beef Cattle

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This study was initiated to determine the blood cytology of cattle affected with shipping fever and to compare it with the blood cytology of healthy cattle. The normal blood picture may vary considerably depending upon the number of animals in the sample, age, species, sex, and individual. Altitude, diet, and other environmental conditions are also factors in producing variations, so it is not surprising that information concerning the normal bovine blood picture by various authors shows a marked variation.

In order to make reasonably accurate conclusions as to the significance of the

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TABLE 1—Summary of Normal Bovine Blood Picture as Recorded by Various Authors

Author	Erythrocytes (millions)	Leukocytes (thousands)	Neutrophils (%)	Lymphocytes (%)	Monocytes (%)	Eosinophils (%)	Basophils (%)
Braun[1]	7.12	9.347	27.0	56.1	7.8	8.4	0.7
Coffin[2]	5.4-9.0	4.5-13	30.0	52.0	9.0	8.0	0.5
Delaune[3]	8.70	10.7	19.6	64.4	12.2	3.3	0
Dukes[4]	6.3	7.9	21.0	64.0	10.0	5.0	1.0
Ferguson[5]	6.092	9.168	37.53	38.22	8.96	13.980	0.052
Holman[6]	6.0	8.0	30.0	52.0	7.0	10.0	---
Kolmer[7]	5.0-10.3	5.0-12.0	---	---	---	---	---
Scarborough[8]	6.6	9.3	42.0	55.0	9.0	8.0	0.6
Wintrobe[9]	6.96	7.5	3.5	96.0	0	0.5	0

variation in cell and differential counts of animals with shipping fever, it was necessary to determine the normal blood picture of cattle from the same feedlot, so that age, shipment, altitude, ration, species, and grade of animal would be as similar as possible.

MATERIALS AND METHODS

Animals.—There were 334 cattle used in this study. After clinical observation, these animals were divided into two groups. The normal group, containing 100 animals, was composed of cattle that appeared healthy. Those in the shipping fever group numbered 234, and blood samples were taken as soon as typical symptoms of shipping fever were apparent, but before treatment was initiated. The majority was of the Hereford breed; the remainder consisted of Aberdeen Angus and mixed breeds. All were feeder calves under 8 months of age, and were either steers or heifers. All of the animals in this study had been recently shipped into the feedlot from Colorado or other western states. The feedlot was located at Greeley, Colo., altitude 4,648 feet.

Blood Tests.—A 14-gauge needle was used to draw 3 cc. of blood from the jugular vein into a tube into which a solution of potassium oxalate

TABLE 2—Comparison of the Blood Picture of 234 Cattle Affected with Shipping Fever and 100 Normal Cattle

	Mean	Standard deviation	Range	$\bar{x}_1-\bar{x}_2$	"t"	Level (%)
Erythrocytes (millions per cmm.)						
Normal	8.262±0.101	1.009±0.072	6.30-11.55	−0.464	2.918	1
Shipping fever	8.726±0.122	1.866±0.086	4.25-14.45			
Leukocytes (thousands per cmm.)						
Normal	9.094±0.237	2.365±0.168	4.90-19.50	−0.739	2.22	5
Shipping fever	9.833±0.235	3.604±0.167	2.50-27.60			
Neutrophils-segmented (%)						
Normal	26.55 ±0.461	4.61 ±0.328	10.0 -52.0	3.381	3.338	1
Shipping fever	23.17 ±0.902	13.81 ±0.639	1.5 -77.0			
Neutrophils-bands (%)						
Normal	0.67 ±0.864	8.37 ±0.595	0-4.0	−10.60	10.537	1
Shipping fever	11.27 ±0.517	7.901±0.366	0-43.0			
Neutrophils-metamyclocytes (%)						
Normal	0	0	0	−0.596	4.846	1
Shipping fever	0.60 ±0.123	1.88 ±0.087	0-20.0			
Lymphocytes (%)						
Normal	61.79 ±0.938	9.38 ±0.667	39.0 -77.5	3.325	2.350	2
Shipping fever	58.46 ±1.060	16.22 ±0.751	17.5 -90.0			
Monocytes (%)						
Normal	7.11 ±0.326	3.26 ±0.232	1.0 -18.0	1.073	2.696	1
Shipping fever	6.03 ±0.230	3.51 ±0.163	0-19.0			
Eosinophils (%)						
Normal	3.90 ±0.285	2.85 ±0.203	0-14.5	3.289	3.638	1
Shipping fever	0.61 ±0.858	13.13 ±0.608	0-13.0			

Mean = arithmetic mean and standard error; standard deviation = standard deviation and standard error; "t" = ratio of the difference of two sample means to the standard error of the difference; $\bar{x}_1-\bar{x}_2$ = difference of the means of the group affected with shipping fever and the normal group; level = level of significance.

had been placed and the water evaporated, leaving approximately 10 mg. of potassium oxalate in dry form. Smears for the differential counts were made in duplicate from blood taken directly from the bleeding needle.

Red and white blood cell counts were made in duplicate from the oxalated blood samples, using certified Thoma diluting pipettes and Hayem's solution for red cells and 0.1 N hydrochloric acid for white cells. A Spencer bright-line improved Neubauer counting chamber was used.

Smears for differential counts were stained with Giemsa's stain, and the count was based on 200 cells for each sample.

RESULTS

A comparison of the means (table 2) of the cattle affected with shipping fever and those of the normal cattle indicated that there was a highly significant increase (1% level) in total erythrocytes, band cells, and metamyelocytes, but only a barely significant increase (5% level) in total leukocytes in the group of cattle with shipping fever. The percentages of segmented neutrophils, monocytes, and eosinophils decreased to a highly significant degree (1% level) and the lymphocytes decreased to a significant degree (2% level) in the shipping fever group when compared with the normal group of cattle.

A comparison of the means (table 3) of the cattle that recovered from shipping fever and those that died of shipping fever indicated that there was a highly significant increase (1% level) in the percentage of lymphocytes and a barely significant increase (5% level) in total erythrocytes in the group that died of shipping fever. The percentages of segmented neutrophils, metamyelocytes, and eosinophils decreased to a highly significant degree (1% level), while the decrease in total leukocytes was barely significant (10% level) in the group that died of shipping fever. There was no significant difference in the percentages of band neutrophils or monocytes between the

TABLE 3—Comparison of the Blood Picture of 218 Cattle that Recovered from Shipping Fever and 16 that Died of Shipping Fever

	Mean	Standard deviation	Range	$\bar{x}_1 - \bar{x}_2$	"t"	Level(%)
Erythrocytes (millions per cmm.)						
Recovered	8.66±0.125	1.850±0.089	4.25-14.45	−0.913	1.968	5
Died	9.57±0.447	1.787±0.326	6.8 -13.5			
Leukocytes (thousands per cmm.)						
Recovered	9.94±0.250	3.693±0.177	2.5 -27.6	1.512	1.693	10
Died	8.43±0.858	3.430±0.626	3.05-13.95			
Neutrophils-segmented (%)						
Recovered	23.88±0.939	13.86 ±0.665	2.0 -77.0	10.44	3.564	1
Died	13.44±2.775	11.10 ±2.026	1.5 -35.0			
Neutrophils-bands (%)						
Recovered	11.33±0.530	7.82 ±0.375	0-43.0	0.86	0.361	NS
Died	10.47±2.323	9.29 ±1.695	0-33.0			
Neutrophils-metamyelocytes (%)						
Recovered	0.60±0.126	1.87 ±0.896	0-20.0	0.10	3.344	1
Died	0.50±0.193	0.77 ±0.141	0-2.0			
Lymphocytes (%)						
Recovered	57.75±0.347	5.13 ±0.246	17.5-90.5	−10.41	2.740	1
Died	68.16±3.810	15.24 ±2.781	46.0 -97.0			
Monocytes (%)						
Recovered	5.96±0.221	3.26 ±0.157	0-19.0	−1.01	0.850	NS
Died	6.97±1.155	4.62 ±0.843	0-18.5			
Eosinophils (%)						
Recovered	0.64±0.089	1.32 ±0.063	0-13.0	0.36	2.880	1
Died	0.28±0.088	0.35 ±0.064	0-2.0			

Mean = arithmetic mean and standard error; standard deviation = standard deviation and standard error; "t" = ratio of the difference of two sample means to the standard error of the difference; $\bar{x}_1 - \bar{x}_2$ = difference of the means of the group that recovered from shipping fever and the group that died of shipping fever; level = level of significance; NS = no significance.

animals that recovered and those that died of shipping fever.

SUMMARY

1) A hematological study of 234 beef cattle with shipping fever revealed the following mean values with their standard errors: erythrocytes per cubic millimeter, 8.726±0.122 million; leukocytes per cubic millimeter, 9.833±0.235 thousand; segmented neutrophils, 23.17±0.902 per cent; band neutrophils, 11.27±0.517 per cent; metamyelocyte neutrophils, 0.60±0.123 per cent; lymphocytes, 58.46±1.060 per cent; monocytes, 6.03±0.230 per cent; and eosinophils, 0.61±0.858 per cent.

2) A hematological study of 100 normal beef cattle from the same feedlot revealed the following mean values with their standard errors: erythrocytes per cubic millimeter, 8.262±0.101 million; leukocytes per cubic millimeter, 9.094±0.237 thousand; segmented neutrophils, 26.55±0.461 per cent; band neutrophils, 0.67±0.864 per cent; lymphocytes, 61.79±0.938 per cent; monocytes, 7.11±0.326 per cent; and eosinophils 3.90±0.285 per cent.

3) Results of the "t" test for testing the significance of a mean difference between the group of cattle affected with shipping fever and the normal group indicated a significant increase in total erythrocytes, total leukocytes, band cells, and metamyelocytes in the shipping fever group. The percentages of segmented neutrophils, lymphocytes, monocytes, and eosinophils decreased to a significant degree in the shipping fever group.

4) Results of the "t" test between the group of 218 cattle that recovered from shipping fever and the group of 16 cattle that died of shipping fever indicated a significant increase in total erythrocytes and lymphocytes, while the total leukocytes, segmented neutrophils, metamyelocytes, and eosinophils decreased to a significant degree in the group that died of shipping fever.

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Bovine Mastitis Due to Yeasts

Recently, 7 cows with mastitis due to yeast were encountered. Ten yielded pure yeast cultures and 7 were mixed with bacteria. The milk appeared thin with occasional small clots; marked induration of the quarters occurred rapidly with acute pain. Antibiotics or sulfonamides quickly cleared up the bacterial infection but seemed to aggravate the inflammation. Intramammary iodine in liquid paraffin was the only therapeutic agent of any benefit. If given early without antibiotics, improvement was apparent in twenty-four hours and in all but 1 cow the udder seemed normal within seventy-two hours. Doses larger than 50 cc. were of no advantage.—*Vet. Rec., May 16, 1953.*

Photosensitization in Goats

An owner complained that his goats had developed a peculiar condition on the white sections of their skin. The skin first became red, then brown, then black, then began to curl up and peel, leaving a large, red, sensitive sore. Some would not lie down, while others had difficulty in rising. The diagnosis was photosensitization.—*Dai. Goat J., July, 1953.*

[A similar condition in swine may be mistaken for chronic swine erysipelas.—ED.]

Isolation of *Salmonella Pullorum* from a Chinchilla

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A disease problem was presented by a grower of chinchillas for our consideration in November, 1952. Two chinchillas from the herd of 14 had died during a four-week period. The carcass of the second animal was submitted for examination. The owner had noted, in both cases, a decrease in appetite for one week prior to death but no other symptoms.

Postmortem examination revealed an abscess involving the liver, diaphragm, and lungs, with adhesions between these organs. The contents were of a caseous nature, possibly indicating tuberculosis, but no acid-fast organisms were demonstrable in stained smears of the exudate. Primary cultures were made by streaking the exudate on brilliant green agar and tryptose agar.

After twenty-four hours' incubation of the inoculated agar, a mixed bacterial population was noted; and the brilliant green agar gave evidence of Salmonella organisms. Single colony transfers were made from the brilliant green agar and a pure culture was obtained of the suspected organism. Fermentation studies were made: The organism was found to ferment dextrose and mannitol without gas formation and failed to ferment lactose, maltose, and saccharose. The organisms were nonmotile and gram-negative. A culture derived from a single isolated colony was agglutinated by serum from a *pullorum*-reactor chicken and by antiserum produced with Gwatkin's Proteus I.[1] Thus, it was indicated that the organism was *Salmonella pullorum* with a major XII_2 antigenic component.

Identification of the organism as *S. pullorum* (XII_2) was confirmed by the U.S. Public Health Service.*

The owner indicated no poultry products had been fed to the chinchillas. However, a bale of hay which might have been contaminated with chicken droppings had been fed.

Fecal samples were obtained from the remaining 12 chinchillas. These were inoculated into tetrathionate broth and incubated for sixteen hours at 37 C.; subinoculations were made on brilliant green agar and incubated for forty-eight hours. No evidence of Salmonella species was noted. Serum samples from the remainder of the herd were not available, although agglutination tests would be of interest.

We do not desire to infer that the presence of *S. pullorum* accounted for death in this case. However, *Salmonella typhimurium* has been previously incriminated as a pathogen for chinchillas.[2] The pathology noted in this case was not similar to that described for *typhimurium* infection in chinchillas. This report is made only to indicate the isolation of *S. pullorum* from an additional mammalian species. Dr. P. R. Edwards has indicated that, to his knowledge, this is the first recorded isolation of this bacterium from a chinchilla. We have not been able to find reports of any previous isolations in our search of the literature.

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*Enteric Bacteriology Laboratory, Communicable Disease Center, U. S. Public Health Service, Federal Security Agency, Atlanta, Ga.

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Lindane for Poultry Mites and Lice

Investigations have demonstrated that lindane, in 0.5 per cent solution, applied to the walls, roosts, cracks, and crevices of a poultry house will assure excellent control of mites and lice. The lice are affected by the vapor action from the lindane on the roosts. Lindane apparently had no adverse effect upon young chickens. —*U.S.D.A.*

In pneumoëncephalitis (Newcastle disease), egg laying drops to zero in two or three days. Weeks later the flock may reach 40 per cent of the original production but may never again be able to show a profit.—*C. D. Lee, D.V.M., Ames, Iowa.*

Three-Day Sickness of Baby Pigs

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THE QUESTION of sudden death of suckling pigs during the first days after birth is unusually interesting. It seems to be of great economic importance in the United States of America. In Europe, it probably occurs far less, and perhaps in many countries it does not occur at all so that it has received no special attention. If the whole litter perished, the dams were eliminated from the breeding stock. This simple measure of animal selection either has not been recognized in the United States or has been neglected. Apparently, they still try to solve the etiology either by bacteriological methods or through nutrition.

Moreover, this problem may serve to show the importance of a detailed and scrupulously performed autopsy—the investigation of all organs even in epidemiological research. The loss of many of these baby pigs may be caused by uremia due to a peculiar obstruction of the ureters which develops with the increase in urine secretion after birth. Apparently, as the first part of the ureter dilates it forms a kink near the pole of the kidney which obstructs the flow of urine.

When the author first encountered this problem thirty years ago, he diagnosed it by introducing a catheter into the ureters, with subsequent fluid injections to prove their potency. The pelvis and the portion of the ureters adjacent to the kidneys were noticed to be somewhat dilated so they were measured by comparing their volume with those from normal baby pigs which had perished from other diseases. By this means the obstruction was discovered.

This problem should be studied from the standpoint of the inheritance of congenital anomalies, especially in the United States where it probably occurs often.

The tendency to obstruction of the ureters may not impair other qualities for breeding, so the dams and the pigs which survive may be maintained. However, if heredity is not taken into consideration, such anomalies may eventually disqualify the whole breeding stock.

The discovery of this anomaly was not considered important when first noted by the author, so just a short account was published in the *Veterinary Review* at Brno (vol. *14*, 1921) and apparently went unnoticed in this local Czech journal. This year, however, the author reviewed the literature, since he has been consulted by zoötechnicians about similar losses from enzoötics of suckling pigs. Reports of the baby pig losses in the United States were then seen. There, it apparently is considered either a hypoglycemia or uremia, but the cause was not reported. One report[1] stated that pigs' skins were rough, their temperature normal or subnormal, they were markedly hypersensitive, tried to isolate themselves, squealed and trembled if disturbed, and suffered from diarrhea. Death occurred within nine days, preceded by convulsions. The course of the disease in American pigs is thus longer than in those here. However, it has been reported that death from uremia may occur up to ten days following the extirpation of both ureters. The writer questions if what was considered convulsions may not have been the squirming caused by urinary colic.

A constant finding in uremia of suckling pigs is a precipitate obstructing the papillary ducts of the kidney or lying freely in the pelvis and ureter in the bladder. The infarcts in the kidneys are orange, sometimes very bright, and consist predominantly of uric acid and urates.* The uric acid and the urea in the blood are increased. The kidney is pale and the capsule may be easily peeled off. Pressure may cause the precipitate in the kidney pelvis to flow into the ureter. It is probable that on removing the kidney at autopsy, the ureter is extended and straightened so the occluding bend or kink is not discovered.

A valuable description of the disease with quotations from other authors was given by Young[1,2] who called it "baby pig disease." He excluded the possibility of contagious gastroenteritis.

These pigs, farrowed by apparently healthy sows, looked normal at birth but a few hours later showed symptoms of the disease. The first symptom was diarrhea six to forty-eight hours after birth, and general symptoms were evident forty-eight to seventy-two hours after birth. An inadequate ration for the sows during the gestation period was considered as a cause since attempts to find an infectious agent had failed, yet no change of ration during the gestation or lactation period could diminish the losses. Other observations have opposed the assumption that the disease is caused by inadequate nutrition.

If neither nutrition nor an infectious agent is the direct cause of these enzoötic losses of baby pigs, a theory has been proposed that this could be a reversed anaphylactic shock.

Dr. Lukes is professor of microbiology at the medical school of Masaryk's University in Brno.

*Infarcts of uric acid are routine findings at autopsies of infants and are considered proof that the child had breathed.

We fully agree with Young's opinion that this sickness is not the result of a faulty ration or of any infectious disease. The matter of hypoglycemia may also be disposed of, since the low level of sugar in the blood may be the result of the baby pigs' refusal of food. Hypoglycemia may occur also in healthy baby pigs which have been put on a hunger ration.

However, it is necessary first to be sure that it is a case of uremia; then the cause has to be determined. According to Young, it is an allergic impairment of the kidney as a reaction of the hypothetic viral antigen to hypothetic antibodies which have entered the body of the sucking pigs with the colostrum. We shall, therefore, examine his hypothesis critically. We believe it is far from being so absolutely sure as he thinks.

First, his suggestion as to infection of the dams during gestation has been based on the assumption of sickness without symptoms. The fact that sucking pigs fall ill following an experimental infection by hog cholera is no proof of anaphylaxis, either direct or reverse. Uremia shows some common symptoms with anaphylaxis. Moreover, the principal sign of anaphylactic shock, *i.e.*, the sudden appearance of the symptoms leading to death of the sucking pigs, are entirely missing. Also, if the pigs refused food, antibodies can not have entered their bodies in colostrum. Furthermore, nature does not use such complicated methods as reverse anaphylactic shock, but directs its manifestations by simple laws. The comparison with rubeola (measles) is not suitable, the fetus in that case having suffered quite different impairments than those observed in so-called baby pig disease. Bacterial and viral infections might manifest themselves in quite different ways. Some might result in abortion, others in a fatal or mild course, but the deaths probably would never reach the proportions as in these litters of sucking pigs. Hence, another cause of the uremia should be sought. My explanation of the sudden deaths of sucking pigs is that which I published in 1920, *i.e.*, heredity and anatomical changes.

In the year mentioned, sucking pigs from three breeding stocks were sent to the Institute of Pathology to ascertain by autopsy the cause of the death, mostly during the first two days after birth, of whole litters. The veterinary surgeons who submitted the specimens lived in districts, each rather distant from the other, yet all in the same manner described the course of the disease and stressed the absence of infection in the breeding stock. They attributed the disease either to inadequate nutrition, especially to molasses added to the food of the dams, or to the possibility of inbreeding. All were of the improved German breeding stock of pigs. Whole litters of nearly all dams were perishing.

The pigs were full of life without any sign of impairment when born. However, two hours later the first symptoms appeared. They became restless, had no desire to suck, gasped for breath, squealed, and revealed cyanosis. Later, the symptoms of asthma increased and they died with subnormal temperatures. The whole course did not take more than forty-eight hours. As an exception, 1 or 2 pigs in the litter remained healthy. During 1952, half of the pigs of some litters survived. Family inbreeding in the German breed of improved hogs seems of special significance.

All German books on hog breeding remark that family inbreeding should be abandoned as it made the raising of the stock impossible. It would be of interest to learn if this condition was in part responsible for inbreeding difficulties.

Our autopsies usually revealed only slight changes: cyanosis of the extremities, snout, and ears; a slightly increased amount of transudate in the pericardial, pleural, and peritoneal cavities; hypostasis; and a beginning edema of the lung. All organs were normally developed and no petechiae were found as in anaphylactic shock. Also, the kidneys were without macroscopic changes, such as infarcts of uric acid, and the capsule was easily detached. The kidneys were moist, with a venostasis on the margin of the medular and cortical substance. Microscopic examination showed no marks of inflammation, the glomeruli only being detached from the capsule, thus presenting signs of edema. A careful examination, however, disclosed that the kidney pelvis and the ureters were somewhat dilatated but not in a striking manner so as to attract the attention of the person performing the routine autopsy.

The catheterization of the ureter was impossible either *in situ* of from the pelvis or the bladder. There was always an obstacle at the lower pole of the kidney. Neither could the ureter be washed in the direction of the pelvis. The bladder was usually empty. We found that at the place where the ureter separates from the pelvis it was bent, its widened wall overturned, forming a *ventil* (kink) which blocked the flow of urine from the kidney.

Microscopic examination revealed a hypertrophy of the wall of the pelvis and the ureter above the obstruction.

The anomaly is caused by an excessively long ureter which is bent and creates a closed kink. A detailed study of the genesis of this anomaly shows why it occurs only in pigs. Of all mammals, the pig is most often affected by hydronephrosia.

Large hydronephrotic sacks are formed by the intermittent stoppage of the urine flow from the kidney. If it is bilateral, it leads to a very slight enlargement of the kidney pelvis and death occurs from uremia before hydronephrosia develops. The extirpation of both kidneys in an animal results in death within two to ten days. Convulsions are not a constant feature in the clinical picture of uremia.

Obstruction at the place where the ureter passes

through the wall of the bladder may explain cases in which the ureter has become enlarged in its entire course. However, even this enlargement may not be striking and has often been overlooked in a superficially performed autopsy.

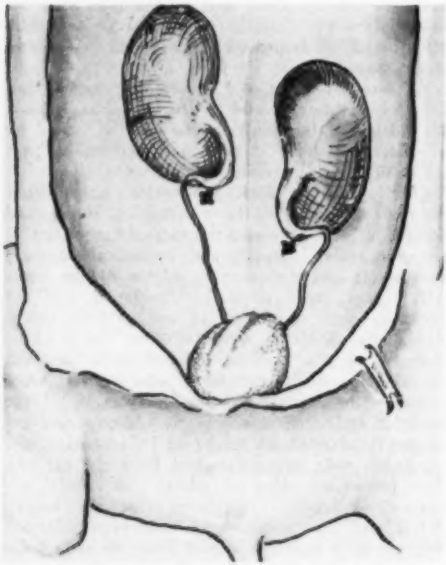

Fig. 1—Sketch of urinary organs of an affected pig, showing obstructed, dilated ureters.

According to my observations, the enlargement of the ureter in pigs occurs mostly in the upper third of its course along the kidney, and the enlargement throughout the entire course is less common.

The ureter in pigs runs from the pelvis along the medial margin of the kidney, then bends laterally and, at the posterior pole of the kidney, it bends again in the distal direction. This is where the obstruction was usually found, together with the enlargement above it.

The bacteriological examination of all our pigs had a negative result. Hence, we may assert that death was caused by uremia. The question has arisen: Why had not hydronephrosia developed in embryonal life? However, the secretion of the kidney during embryonal life is insignificant. Only after respiration has begun is the amount of urine increased which, together with the pressure on the obstruction, creates a kink which obstructs the existing small passage. In some animals, the obstruction develops more slowly and this probably explains the time differences in the deaths. Even after extirpation of the kidneys, the animals did not die simultaneously; the differences were considerable. A pig with rudimentary kidneys may be born well developed but die with symptoms similar to uremia, and the changes in the kidneys may not be considerable.

The clinical symptoms of this developmental anomaly may be summarized as follows: The affected pigs are always the young of healthy parents which, immediately after birth, are full of life. As a rule, all pigs of the litter are affected. According to other observations, rarely 1 or 2 pigs or even half the litter my remain healthy. The unaffected young pigs show no symptoms.

We eliminated infection on the basis of anatomical findings. The absence of petechiae or extensive hemorrhage and the course of disease refute every possibility of anaphylaxis. Not a single case of infectious disease has been observed in the district where the losses occurred.

Changing the breed always stopped the disease promptly. Also, during this past year an apparently successful measure has been introduced, *i.e.,* to remove sows which farrowed affected litters. This indicates that it is a hereditary failure to which some herds are particularly susceptible.

There are still two questions of interest to be answered:

First, whether the disease in the United States is the same as that in our country and second, why the cause elucidated by us has been overlooked there.

The first question in my opinion may be answered positively. The described symptoms resulting in death are similar in our country and in the United States.

The far greater incidence of the disease in the United States may be explained by the accumulation of animals susceptible to the anomaly mentioned.

The other question (why this anomaly has not been found and evaluated) is easily understood for the changes are slight and easily overlooked at autopsy.

It may be assumed that very probably the cause of mass losses of baby pigs in the United States may be attributed to the developmental anomaly of ureters resulting in their obstruction which occurs only after birth. This leads to anuria and to uremia with typical symptoms without convulsions. Appropriate breeding management in animal husbandry may lead to the elimination of disease.

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In May, 1953, a baby seal was being raised on goat milk at the San Diego, Calif., zoo.—*Dai. Goat J., May, 1953.*

Parakeratosis in Swine

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A CLINICAL and pathological study is reported of a dermatosis in swine that is characterized by hard, dry, crusted proliferations of the superficial layer of the epidermis. It is a benign disease of young swine between the ages of 8 and 16 weeks, as a rule, and usually terminates spontaneously in complete recovery. The specific cause of this condition is not known.

SYMPTOMS OF PARAKERATOSIS

The presence of keratinous crusts on the surface of the skin constitutes the chief symptom. They vary in size, shape, and thickness depending on the part of the body involved and on the time in the course of the disease that the observation is made. In regions of the body where the hairs are short, the crusts are generally compact and their outer or free surface is granular. In regions where the hairs are long, the hairs usually become entangled or matted in the crusts. The crusts sometimes get to be 5 to 7 mm. thick and, as a rule, they are not firmly attached to the underlying cutaneous structures. The crusts are separated by clefts or crevices which often contain a moist and somewhat sticky brownish to black colored substance. This is an admixture of a secretion from cutaneous glands and particles of soil and other debris.

Lesions tend to develop on the skin of the legs in the early stages of the disease. The regions of the pastern, fetlock, and the hock are the sites generally involved. The nasal, periorbital, and aural regions of the head also show lesions early in the disease. The regions of the shoulder, withers, sacrum, thigh, flank, and abdomen are vulnerable areas and many times are the first to show the crusted proliferations. In some cases, the lesions are confined to one or another of the regions mentioned above. More often, however, two or more of the regions show the symptoms of the skin disease (fig. 1) and in some cases it affects the skin of practically the entire body surface (fig. 2 and 3).

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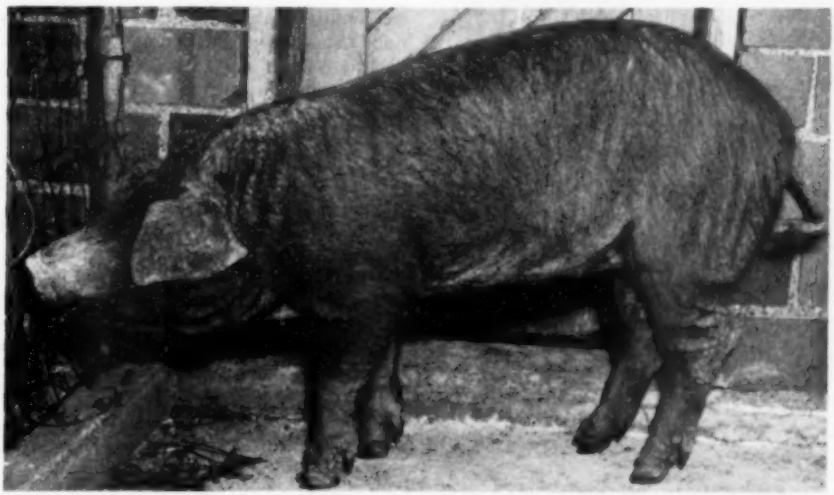

Fig. 1—Parakeratosis in a 14-week-old Duroc female. Typical of many cases are the crusted proliferations in the regions of the fetlock, pasterns, hock, withers, and nose.

This disease does not seem to cause the patients much discomfort or distress. They do not scratch or rub the body, indicating that the lesions do not cause an irritation. Except in severe cases, the appetite and food intake are not impaired. Many of the affected pigs continue to grow and develop at rates considered satisfactory for their dietary regimen. Some, however, lose weight during the course of the disease. A marked dehydration of the subcutaneous tissues occurs and causes the skin to form large folds or wrinkles.

Fig. 2—Parakeratosis in a 9-week-old Poland China male. The skin of the entire body is involved.

Fig. 3—The same pig shown in figure 2.

HISTOPATHOLOGY

Histological studies were made on biopsied skin specimens taken from 14 pigs. Microscopically, the crusted masses are composed of cornified epithelium, collections of paraëleiden (keratin), and debris. For the most part, the cornified epithelium is arranged in layers which in some areas becomes very thick and forms a wavy mass (fig. 4). In other areas, the cornified layers pile up in an irregular fashion. Great numbers of nuclei are scattered throughout the proliferated and keratinized substance. In some places, the nuclei are deployed in rows and help to delineate the layering arrangement of the desquamating stratum corneum. In other places, the nuclei are collected together in rather dense masses. In many of the sections examined, the malpighian layer of the epidermis was thinner than this layer in similar sections taken from normal pigs. No significant tissue alterations occurred in the derma. At the base of some of the clefts referred to above, small collections of granulocytes and masses of amorphous material were seen.

It seems significant that none of the many cases we have followed came to necropsy because of the disease, so that the inspection of a cadaver for significant tissue changes in the digestive, respiratory, and urogenital organs was limited. In order to learn whether any important changes did occur, 1 pig was killed and carefully examined. The results of this examination, except for the lesions in the skin, did not disclose any tissue alterations which might be construed as being associated with the skin disease. Sections from the various organs were taken for histological examination but no significant changes were observed.

OBSERVATIONS ON PARAKERATOSIS

Our experience with this disease extends over a period of eleven years. For the

most part, the observations and studies were made in a drove of swine maintained by the Department of Animal Husbandry of the University of Minnesota. Between 400 and 600 pigs are farrowed each year, of which about two thirds are born in the spring farrowing season and one third in the fall. The racial composition of the drove is divided about equally between the Chester White, Duroc, and Poland China breeds. The general management of the drove in respect to feeding, housing, and sanitation is excellent.

Fig. 4—This photomicrograph of the epidermal layer of the skin was taken from a biopsy from the pig in figure 1. Thickness of the stratum corneum is markedly increased, with a distinct layering of the cornified epithelium and the presence of nuclei throughout this layer. Nuclei are in rows in some parts of the section and collected into masses in other areas. A collection of inflammatory cells appears at lower edge of section and just to right of center. The large rounded and relatively acellular spaces are pegs of the derma that project into the epidermis.

The condition was first recognized as a disease entity in this drove in December, 1942. Prior to this date, a few cases of the skin disease described here were observed but were mistaken for sarcoptic mange. In December, 1942, approximately 35 per cent of the pigs farrowed two to three months previously were affected. Repeated search without finding mites convinced us that we were not dealing with mange. About this time, biopsied pieces of the skin from affected areas were macerated and ground in a mixture of sterile sand and isotonic salt solution and rubbed into a scarified area of the skin of 3 healthy pigs, but no lesions resulted. These results tended to rule out an infectious cause and at the same time it suggested the possibility of being due to a nutritional or metabolic disturbance. At the time of its occurrence in 1942, the pigs were receiving rations containing dried buttermilk and there seemed to be an increase in the number and severity of the cases when dried buttermilk constituted 8 to 10 per cent of the ration. It is important to mention at this juncture that while attempting to learn whether it was a parasitic, bacterial, or viral disease, some of the affected pigs were beginning to show signs of recovery. This occurred without making any change in the dietary regimen.

A few preliminary trials to produce the disease by feeding several different rations compounded from yellow corn, oats, alfalfa meal, soybean oil meal, tankage, and dried buttermilk in various combinations and proportions have been conducted without success. The disease has not been found among pigs which had access to good pasture. Moreover, pigs that developed the disease under the drylot-feeding conditions would, when transferred to pasture, show an accelerated rate of recovery over the pigs remaining in the drylots.

The condition we have described is a primary disease of the skin. It is marked by tissue alterations such as characterize parakeratosis. Parakeratosis, according to Lever,[1] signifies an imperfect keratinization of the skin. It is characterized by retention of nuclei in the horny layers. This was evident in the sections examined and is the basis for using the term as a

[1]Lever, W. F.: Histopathology of the Skin. Lippincott, Philadelphia, 1949.

provisional name for this disease. In hyperkeratosis, the histological picture is one in which there is an increased amount of keratinized substance in the epidermis, but it is essentially devoid of nuclei.

A Swine Fever-like Disease

A highly contagious and fatal disease of pigs in Berlin (Germany) accompanied by convulsions and posterior paresis is apparently a modified form of swine fever (hog cholera). Filtrates of blood from infected pigs transmitted the infection. Two pigs immunized against swine fever remained healthy after inoculation with filtrates from a pig with this modified form of the disease.—*Vet. Bull., Dec., 1952.*

Modified Live Virus Cholera Vaccines Approved for Interstate Shipments

On June 20, 1953, the Secretary of Agriculture amended the regulations governing the interstate movement of swine to authorize the use of modified live virus hog cholera vaccines but only when simultaneously given with specified minimum doses of hog cholera antiserum.

It specifies that the dose of antiserum shall in no case be less than a scale ranging from 30 ml. for 20- to 40-lb. pigs; 50 to 60 ml. for 90- to 120-lb. pigs; to 80 to 100 ml. for hogs weighing 180 lb. and over.—*Fed. Reg., June 25, 1953.*

Septicemia and Orchitis in a Ferret

An adult male ferret was reported by the keeper at Lincoln Park Zoo, Chicago, to have been sick for two days. The symptoms were listlessness, photophobia, lacrimal discharge, bilateral nasal discharge, anorexia, temperature 102.8 F., and slight dyspnea. The clinical diagnosis was generalized septicemia.

Fifty-milligram capsules of terramycin Hcl (Pfizer) were administered orally twice daily for four days and then once daily for two days. The ferret was held with heavy gloves and the capsules given with tweezers. Supportive therapy was given subcutaneously and orally. When seen one week later the animal had shown steady improvement with all the original symptoms gone.

However, complete anorexia had developed in the last two days, apparently due to acute orchitis. The temperature was 105.2 F. Penicillin and streptomycin therapy were then prescribed daily for four days and a steady and uneventful recovery was reported. Whether there was a clinical relationship between the original septicemia and the following orchitis is open to speculation.—*L. E. Fisher, D.V.M., Berwyn, Ill.*

Fig. 1—A ferret with generalized septicemia.

Virus Pneumonia in Swine

J. S. FULTON, D.V.M., D.V.S.; ALTHEA N. BURTON, D.V.M.; J. L. MILLAR, V.S.

Saskatoon, Saskatchewan

FOR MANY years it has been considered that pneumonia in swine causes heavier losses in Saskatchewan than all other diseases of swine, and it has been generally accepted that Pasteurella organisms play a major role as causative agents. As the result of recent work, it would appear in some instances that these conclusions are unjustified, since we have isolated Pasteurella from pneumonic lungs in which the primary disease has proved to be viral in nature. Pasteurella isolated from such cases may play some part in the pathological processes but is, in itself, incapable of producing the disease. This pneumonia, which has now been shown to be due to a virus, has been prevalent in the province for a number of years and, although a virus has long been suspected as the cause, actual proof has only recently been obtained. The delay has been due to the fact that we had been dealing with a subacute type of disease where the character of the lung lesions suggested a condition of long-standing in which there would be little likelihood of recovering the virus. Also, the true cause was masked by the constant appearance of Pasteurella.

The virus was first recovered during an outbreak of an acute type of the disease which occurred on an institutional farm where the animals received the best of care and had been free from any disease for many years. Prior to the outbreak, there were 30 breeding swine on the premises, from which 143 young were born. Most of the animals showed symptoms of the disease and before the outbreak subsided 2 brood sows died, as did 32 suckling and 16 weanling pigs.

Virus pneumonia in swine appears in an acute and subacute form, the latter being much more prevalent; in fact, it is only recently that the acute form has been recognized in this province. The subacute condition usually affects only the unweaned animals and the symptoms are often so mild and indefinite in character that the presence of a specific disease may not be suspected. At the onset, affected animals are inclined to isolate themselves and show little interest in food. In some cases there are periodic spells of sneezing which may subside in a few days when the pigs return to normal. In other cases, these symptoms are followed by a husky cough, a slight nasal discharge, accelerated breathing, and a temperature of 103.5 to 105.0 F. At this stage, a few animals may succumb but the death rate is low. However, the morbidity is high; in fact most of the young pigs in a herd are usually affected. Soon after apparent recovery, many of the young animals fail to develop as they should, lose weight, and appear unthrifty. These latter changes may not be associated with what has gone before; the earlier symptoms, because of their mildness, may have gone unnoticed. These set-backs often render the animals quite unprofitable to keep. We have examined many pigs in an endeavor to determine the cause of the unthrifty condition and found all organs normal, with the exception of the lungs which showed the characteristic lesions of the disease in question; these will be described later.

From the virus laboratory, University of Saskatchewan, Saskatoon, Sask.

ACUTE TYPE

The acute form appears suddenly and spreads rapidly through the herd, affecting young and old alike. The early symptoms resemble those described for the more benign form but soon become more pronounced; respiration is greatly accelerated, abdominal breathing is pronounced and jerky. The mortality is high at this stage and those which survive become chronic runts. As the outbreak progresses, the mortality decreases but, since most have been infected, the herd is reduced to a number of very poor individuals.

In herds where the subacute disease has appeared periodically, as it often does, it would seem that the pigs develop some immunity. The acute form does not occur in such herds but only in those which have been totally free from the infection.

POSTMORTEM FINDINGS

Animals showing the acute symptoms were obtained and, after being observed for

several days, were destroyed. Postmortem examination of these acute cases revealed pneumonia, the lesions in most cases being confined to the apical lobe and to the ventral aspect of the cardiac lobe. Even in the early course of the disease, the apical lobe is usually wholely involved, suggesting this as the primary site of infection. In a remarkably short time after the acute inflammatory process has subsided, the infected tissue becomes fibrotic, the change in some instances taking place so rapidly that the entire apical lobe may be a mass of fibrous tissue while the cardiac lobe may still show areas of acute inflammation. This contrasting appearance is very characteristic of the disease. There is a very definite line of demarcation between the gray avascular fibrotic tissue, the normal pink lung, and the dark red hue of congestion where the inflammatory process has not yet subsided. In the subacute form of the disease, the lung lesions are less pronounced than in the acute and more often than not, only one lung is affected. The lung lesions referred to throughout the study were confined to one lung unless otherwise stated.

Fig. 1—Lung from a field case of virus pneumonia in swine. Most of the apical lobe and a portion of the cardiac lobe show fibrotic pneumonia. Other areas show acute inflammation.

I am indebted to Dr. D. F. Moore, head of the Department of Pathology, Medical College, University of Saskatchewan, for the following microscopic descriptions of three specimens of lungs which were examined:

1) Sections of this lung revealed an active early acute bronchopneumonia, in which the striking feature was the absence of any exudation of blood or edema fluid into the alveoli which were filled with masses of polymorphs. This inflammatory cell exudate was so massive in some areas that most of the structural detail was obliterated. Small clumps of purulent exudate were seen in some of the bronchioles.

2) The patchy acute bronchopneumonic process was similar to that described above but appeared to be a few days older. The polymorph infiltration was not as dense, and numerous histiocytes were present in many of the alveolar spaces, which also contained occasional small amounts of edema fluid. There was a moderate infiltration of lymphocytes in the peribronchial fibrous tissue and a prominent interstitial edema in the fibrous interlobular septums.

3) In contrast to the previous specimens, the recent bronchopneumonia was markedly hemorrhagic in character. It had occurred in successive waves, the most recent of which showed a marked polymorph infiltration while the older lesions progressed through stages in which histiocytes were most prominent to those with fibrosis and lymphocytic infiltration. The latter were frequently peribronchial and did not have the appearance of a nonresolution and carnification but rather of a reactive proliferation of the fibrous tissue.

The bronchi were characterized by intense chronic inflammatory reactions with lymphocytes and plasma cells almost obliterating the bronchial walls, as well as pushing into the adjacent lung parenchyma.

Numerous active-lymphoid follicles were involved in this reaction. The lumens of the small bronchi appeared mildly dilated and contained mucopurulent exudate. Healing and healed bronchial ulceration was a common feature.

The epithelial repair was being accomplished by moderately pleomorphic, large cuboidal cells with irregular intracytoplasmic mucous droplets and frequent loss of cilia.

Many areas of the lungs exhibited only a hemorrhagic edema, which was also apparent in the fibrous septums.

The hyperplastic and congested mediastinal lymph node followed the pattern seen in the lungs, with varying stages of acute and subsiding inflammation.

DIAGNOSIS

Specimens 1 and 2 revealed acute bronchopneumonia.

Specimen 3 revealed acute bronchopneumonia, with areas of subsiding bronchopneumonia, chronic ulcerative bronchitis, and acute lymphadenitis of mediastinal nodes.

EXPERIMENTAL TRANSMISSION

The lungs were removed aseptically from a pig which had been ill with the acute form for four or five days. Parts of the fibrotic and of more normal tissues were suspended in saline solution and then ground in a Waring blendor.

Although the disease might primarily be due to a virus, secondary invaders were anticipated and when cultures were made they were found to harbor streptococci.

Rather than risk the loss of the virus while removing the bacteria, it was thought advisable to use the untreated suspensions. The experimental animals were pigs 4 to 6 weeks old. Two pigs (55 and 56) were given the suspension intranasally and 2 others (57 and 58) were placed in the same pen. The 4 were observed closely and temperatures taken daily.

The temperature of pig 56 rose to 103.8 F. after three days and reached 105 F. on the tenth day, while that of pig 55 rose to 104.5 F. the tenth day and remained high. On the eleventh day, untreated pig 58 had a temperature of 105.4 F., which continued high until it was destroyed, while the temperature of pig 57 rose to 104.8 F. on the eleventh day but returned to normal in two days, where it remained.

All of these pigs, except pig 57, sneezed, had a slight nasal discharge for a few days, developed a slight cough and, when excited, showed increased respiration. Their appetite was not noticeably affected.

On the eighteenth day, all were destroyed. The postmortem findings were:

Pig 55—typical lung lesions, the entire apical lobe and part of the ventral aspect of the cardiac lobe being fibrotic.

Pig 56—the entire apical lobe and one-eighth of the cardiac lobe had become fibrotic while other parts of the cardiac lobe were congested.

Pig 57 (untreated)—the lesions were slight and confined to the apical lobe where there were adhesions.

Pig 58 (untreated)—marked lesions, the apical lobe and a fourth of the cardiac lobe fibrotic.

Since the material with which these animals were inoculated contained Streptococcus, cultures were made from the lungs to determine if that organism had survived. All cultures were free from Streptococcus but Pasteurella was found in the lungs of 3 animals and unrecognized organisms in pig 57.

Throughout these studies, each lung used for transmission experiments was cultured as were those of experimental animals contracting the disease. A suspension of all organisms isolated was given to mice intranasally and subcutaneously to determine pathogenicity. In all instances the mice remained well.

Pigs received later from the infected premises had passed the acute stage of the disease and although they still showed marked abdominal breathing, their temperatures had returned to normal. They appeared to have normal appetites but had lost weight and were quite unthrifty. Their lungs showed typical lesions but more extensive than those first examined, both lungs being affected in some instances. Parts of the lungs were ground as previously, but the suspension was passed through a Seitz filter to render it sterile. Cultures made prior to filtration produced Pasteurella.

Pigs 31 and 33 were given the filtered material intratracheally and their temperatures were taken daily. On the fourth day the temperature of pig 33 rose to 104.2 F., on the sixth day to 105.2 F., and continued high until the sixteenth day when it was destroyed. Typical lesions were revealed, the apical lobe of the right lung being partly fibrotic while the remainder was congested. Part of the cardiac lobe was also involved. Bacterial cultures showed the presence of Pasteurella. Animal 31 at no time had a temperature higher than 103.6 F., nor an impaired appetite, and although sneezing was noticed for a few days there was no cough. In spite of this, postmortem findings were much the same as those found in pig 33, and Pasteurella organisms were isolated.

The lung from experimentally infected pig 58, which had been stored in dry ice, was ground in saline and centrifuged to remove gross particles, then treated with penicillin and streptomycin. This material, which proved sterile bacteriologically, was given intratracheally to pigs 59 and 68. The temperature of pig 59 rose to 104.6 F. on the sixth day and that of pig 68 rose to 104.8 F. on

the tenth day. The temperatures of both remained high but, except for slight sneezing, they appeared normal until the fifteenth day when they were destroyed. The right lung in each case showed extensive lesions in both the apical and cardiac lobes. When cultured, one produced Diplococcus, the other Pasteurella organisms.

After the original outbreak had subsided, 2 pigs were received which had contracted the disease some forty days previously. Their temperatures were normal but a dry, husky cough and marked abdominal breathing persisted. On postmortem examination, the apical and half of the cardiac lobes of both lungs of the first pig, and one lung of the second pig, were completely solidified. Pasteurella organisms were isolated from both cases. Lung suspensions were made, rendered sterile with penicillin and streptomycin, and given intranasally to animals 138, 140, 144, and 146. On the tenth day the temperatures of animals 138 and 146 rose to 103.8 and 104 F., respectively, and remained above normal until the fourteenth day when both animals were destroyed. In each case, the lesions were confined to the apical lobe of one lung and were much less pronounced than those of the other experimental animals examined. Cultures from animal 138 showed a variety of organisms which were not identified, while Pasteurella organisms were identified from pig 146. Pigs 140 and 144 appeared normal and had no marked rise in temperature. On the twentieth day, when both were destroyed, their lungs appeared normal.

DISCUSSION

The virus used to inoculate this last group had lost some virulence, since only 2 of 4 animals became infected, yet it shows that pigs may remain infective for a long period, the virus material having come from a pig which had contracted the disease forty days prior to being destroyed. This illustrates why the disease, when once introduced into a herd, is extremely difficult to eradicate. The subacute type will continue to appear periodically in certain herds for a number of years, especially where permanent pig pens are used. Although few may be lost, there is little uniformity in the animals at the time of marketing.

While we have experienced no difficulty in reproducing the disease, the infective material, even from the acute type of case, is likely to produce the more benign form. This no doubt is due to attenuation of the virus, since all pigs obtained had been sick for not less than four or five days and in all probability would have overcome the infection. Had it been possible to secure material from acutely ill animals earlier in the course of the disease, the results might have been different but because of the distance, only animals which were likely to survive the journey were forwarded.

The regularity with which Pasteurella were isolated from the lungs of experimentally infected pigs, even when the inoculum had been rendered bacteria-free, suggests that these animals may have harbored the organisms prior to inoculation and that, as a result of the experimental infection, growth of this organism was stimulated. Although in every case these organisms proved to be nonpathogenic for mice, it is not inconceivable that their pathogenicity might be increased leading, in some instances, to death from pasteurellosis. In fact, one is led to speculate as to how often this virus may play a part in such outbreaks.

Unsuccessful attempts were made to transmit the disease to experimental animals other than pigs. Guinea pigs and mice were given lung suspensions which had been filtered or treated with antibiotics while others received untreated lung material containing Pasteurella and Streptococcus organisms. Each animal received the dose intranasally and subcutaneously. Eight-day chicken embryos were inoculated with filtered lung suspensions but there was no evidence of virus multiplication.

The possibility of the virus disease in swine having some relation to that of virus pneumonia in man was considered. Therefore, a Rhesus monkey was given filtered lung suspension intranasally but it remained perfectly normal. This animal was not destroyed.

SUMMARY

1) It has been shown that pneumonia in swine which, in some instances, has been thought due to Pasteurella infection is in reality caused by a virus.

2) Lung suspensions from infected animals when rendered bacteria-free by means of filtration or the use of antibiotics readily reproduced the disease in healthy pigs when given intratracheally or by nasal installation.

3) Attempts to transmit the disease to experimental animals other than swine failed.

4) The virus was recovered from a field case forty days after symptoms of the disease were first observed.

Canine Warfarin Poisoning

A 12-year-old coon hound which had eaten warfarin five days previously showed weakness, incoördination, depression, and a noncoagulating hemorrhage in the mouth. After death that evening, autopsy revealed hemorrhages in many areas, one large hematoma and an intussusception of the duodenum into the stomach.

The active ingredient in warfarin is dicoumarin which destroys or prohibits the production of prothrombin. Treatment consists of producing emesis, if the patient is seen early enough, and blood transfusions to provide prothrombin and to replace the blood loss from hemorrhages.—*Iowa State College Vet., No. 3, 1953.*

Cortisone is of value in treating inflammations of the eye and especially so in iritis. It may be injected subconjunctivally (¼ to ½ cc.), and repeated in four days.—*W. G. Magrane, D.V.M., Mishawaka, Ind.*

Meconium Peritonitis

Perforation of the intestines during fetal life, resulting in an aseptic chemical peritonitis due to the irritation of escaping meconium, occurs infrequently. Meconium is a sterile mixture of cast off epithelial cells, bile, fats, swallowed amniotic fluid, mucin, and salts. It first appears and fetal peristalsis commences at about the midgestation period. In 50 per cent of the cases, obstructive lesions such as volvulus, intussusception, congenital bands, kinks, atresia, and stenosis are found. In other cases, the weakness of the wall of the intestine or abnormal meconium may be a factor. They occur most commonly in the duodenum and ileum.

If the perforation occurs early, there will be extensive adhesions and some calcification but if it occurs shortly before birth, meconium, bile, and probably some free air will be found in the peritoneal cavities. The distention of the abdomen and edema of the abdominal wall may cause dystocia. The infant, if born alive, is usually acutely ill, cyanotic, vomits but passes no stools. Surgical intervention is the only recourse but the prognosis is poor. However, if the adhesions are not too extensive and the obstruction and perforation can be repaired, some cases will survive.—*J. Am. M. A., June 13, 1953.*

A Small Animal Carrier

The medical profession has for centuries made use of stretchers, litters, and similar devices for the transportation of patients, but the carrying and transporting of inert dogs and cats has not been so satisfactorily solved.

A carrier (fig. 1) recently devised has proved to be an excellent solution. It is

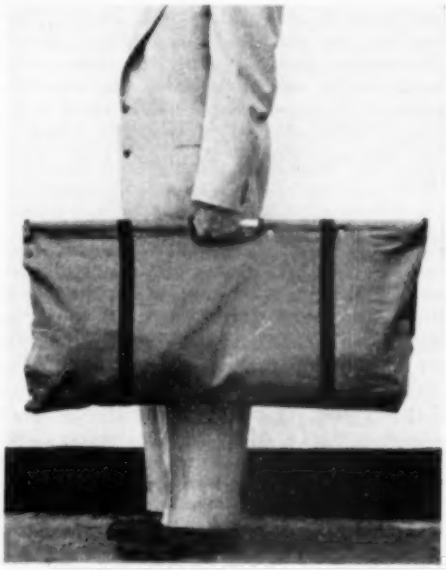

Fig. 1—A small animal carrier.

possible with the carrier to transport the animal in a clean and professional manner under all circumstances and, whenever necessary, with complete concealment.

It is of value: (1) for carrying an animal to and from a car into the hospital—one hand is left free for carrying a bag, opening doors, etc.; (2) for removing a dead or unconscious animal from the scene of an accident without risk of soiling the clothing or car with blood or excreta; (3) for carrying patients from the operating room to the surgical ward without torsion or tension on sutures or ligatures.

The carrier is washable and can be rolled up for compactness.—*Samuel Evans, V.M.D., Philadelphia, Pa.*

Transmission of Enterohepatitis

The cecal worm, *Heterakis gallinae*, is considered to be the means of transmission of enterohepatitis in turkeys. An effort, therefore, was made to determine how the ova of this parasite was carried to the turkey host. Since turkeys eat many grasshoppers, the parasite ova were fed to these insects which, in turn were fed to the turkeys. In the first trial, 1 bird died the thirty-second day, the other recovered after showing symptoms for a month.

The grasshoppers were found to carry the ova at least ninety-six hours after eating them and also to be able to transmit the disease to turkeys for that time. In most trials, each turkey was fed about 50 ova-bearing grasshoppers, but in 2 cases only 2 or 3 infected grasshoppers produced the disease.—*Canad. J. Comp. Med., May, 1953.*

A Fat-Test for Live Animals

The U.S.D.A. announces a test which will determine the degree of fatness of live cattle, sheep, or hogs. It might be useful in selecting breeding stock but is of most value for research in nutritional experiments. An antipyretic drug called "antipyrene" is injected into the animal's blood stream. After a few hours, blood samples are taken at intervals of thirty to sixty minutes and the rate of elimination is determined. The fatter the animal the slower the drug disappears. This antipyrene test has been used by some medical researchers for several years but never before on animals.

Preventing Enlarged Hock Disease

Enlarged hocks in young poults and bowed legs in ducks can be prevented by the addition of niacin and vitamin E to deficient rations. By experiment, it was shown that withholding niacin would produce these disorders, and that the addition of 20 mg. of niacin per pound of feed would prevent them when the ration contained 1 per cent of cod liver oil. However, when the cod liver oil content was raised to 4 per cent the disorders were not prevented.

Apparently, the cod liver oil destroyed the vitamin E content of the ration since, when the latter was added, the diseases were prevented. Brewer's yeast was capable of preventing these conditions (1) because it is an excellent source of highly available niacin and (2) because it contains an antiöxidant capable of protecting the vitamin E in the ration or in the body of the poults.—*World's Poult. Sci. J., April, 1953.*

Micrococcic Enteritis as a Complication of Antibiotic Therapy

Resistant strains of *Micrococcus pyogenes* (staphylococci) have developed in human patients as a result of the administration of antibiotics. They may produce varying degrees of gastrointestinal and systemic reactions which, at times, may be extremely severe. These usually occur after the administration of terramycin or aureomycin. The substitution of erythromycin in doses of 300 to 400 mg., four times daily by mouth, usually eliminates these resistant strains of micrococci and aleviates the gastrointestinal or systemic reactions.—*Proc., Mayo Clinic, March 11, 1953.*

Tuberculosis Testing in Canada

The Health of Animals Division of the Department of Agriculture of Canada reports that 6,475,694 cattle, or 76.2 per cent of the estimated total of 8,500,000, are "under test." Three plans are in operation:

1) the accredited herd plan which pays compensation for purebred herds only, a purebred herd being defined as one having 10 or more purebred cattle of the same breed, registered in the applicant's name, provided they comprise at least one third of the herd; (2) the supervised herd plan for grade cattle, with no compensation paid; (3) the restricted area plan, which is activated when two thirds of the owners sign a petition for the test. Canada is divided into 472 such areas. Practically all the cattle in Ontario, New Brunswick, Nova Scotia, and the southern part of Quebec have been tested.—*Canad. Tuberc. Bull., March-April, 1953.*

Because edema of the scleral conjunctiva may be an allergy, try an antihistamine plus hot packs.—*W. G. Magrane, D.V.M., Mishawaka, Ind.*

Organic Insecticides for the Control of Swine Mange

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DESPITE THE generally successful and widespread use of recently introduced insecticides such as *gamma* benzene hexachloride (*gamma* BHC) and chlordan, for the control of swine mange caused by *Sarcoptes scabiei* var. *suis* Gerlach, there are surprisingly few critical studies of these and similar chemicals reported in the literature.

Taylor[1] first reported the acaricidal properties of *gamma* BHC against mites of the genus Notoedres in rabbits, and suggested that this chemical might prove efficacious against mites of the related genus, Sarcoptes. Subsequently Hixson and Muma[2] reported control of swine mange with single applications of *gamma* BHC sprays at concentrations of 0.25 per cent and 0.5 per cent, but failed to obtain control at a concentration of 0.082 per cent. Cobbett, Peterman, and Beagle[3] reported eradication of sarcoptic mange of hogs in three herds sprayed with *gamma* BHC at concentrations of 0.13 per cent, 0.195 per cent, and 0.26 per cent, respectively. Spencer[4] reported eradication of Sarcoptes infestations in five herds of swine sprayed with a 0.25 per cent chlordan emulsion. Sweetman and Wells[5] reported complete eradication in a single herd sprayed twice, fourteen days apart, with lindane at a concentration of 0.046 per cent for the first spraying and 0.075 per cent for the second spraying. Lindane is a preparation of BHC containing the *gamma* isomer in a nearly pure form.

MATERIALS AND METHODS

The work described in this paper was performed in South Dakota during the years 1949 to 1952, between the months of September to June of each year. With the exception of tests 9 and 12, and the host-toxicity tests involving the specific miticides which were conducted at South Dakota State College, the work was undertaken on farms widely distributed throughout the state.

Preliminary to the use of neotran and aramite and the intended use of ovotran as sprays on herds afflicted with mange, a few recently weaned pigs were heavily sprayed a single time with concentrations two to five times that planned for acaricidal experiments. Examinations for skin or mucous membrane irritation were made: (a) prior to and immediately following the application of the experimental compound; (b) twenty-four hours after application; and (c) frquently thereafter for at least eleven days.

For each test herd employed, the infestation was classed as severe, and in no case was less than 20 per cent of the herd infested. Lightly infested herds were rejected in the search for satisfactory test animals. A binocular dissecting microscope was used to demonstrate the presence of living sarcoptic mites in skin scrapings taken from animals in each herd prior to treatment. Skin scrapings taken at any time after treatment were examined under a dissecting microscope on the farm and, if found negative, were more carefully examined some hours later in the laboratory under a compound microscope. In making post-treatment observations, large quantities of skin tissue were teased apart, shaken in physiological saline solution, and examined between microslide and coverslip. The process of digesting skin scrapings in sodium or potassium hydroxide solutions followed by centrifuging out the mites was not employed since the presence of dead mites in the tissue samples was of no concern in this experiment.

After the establishment of the existence of infestation in a herd, the animals were sprayed with the material to be tested and then isolated from contact with other swine for the duration of the test. Thereafter, various members of the herd were examined at infrequent, irregular intervals. When possible, the animals were examined twenty-four hours after treatment or sooner, again in one week, and then at monthly intervals. In the case of tests 7, 10, and 11, however, examinations during the first month after treatment could not be made. The period of post-treatment observations was prolonged in each case until live mites could be demonstrated or, failing this, until sufficient time had elapsed to preclude the possibility that existing lesions had escaped detection. In tests 7, 8, 10, 11, and 13, live mites were found, twenty-eight and thirty days after treatment, in such quantities and in such a state of viability as to dispel any doubt that infestations remained well established; these trials were therefore terminated. In test 3, no live mites were found fifty-five days after treatment, but subsequent to this examination the owner disposed of his herd, and the observations were automatically concluded. In the remaining tests, however, the animals involved were examined at irregular intervals for a minimum of 110 days and a maximum of 236 days after treatment.

Each herd selected for inclusion in the experiment was a typical farm herd comprised of brood

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The help of P. Kohler, W. Berndt, and R. Collins is gratefully acknowledged.

sows, their early and late pigs, and in some instances boars and gilts as well. In test 7, the herd consisted only of a group of recently weaned pigs assembled from neighboring farms. The breeds represented were Chester White, Duroc-Jersey, Poland China, and Hampshire, in roughly equal proportions.

All of the animals were sprayed, and all were treated only once. Treatment was administered either indoors or out, depending upon the weather and the facilities available. The animals were tightly crowded into pens, as few as 30 and as many as 125 at a time. In tests 1 and 4, a tractor-powered centrifugal pump delivering 75 pounds per square inch (p.s.i.) was used, the spray being delivered with an ordinary 100-ft. garden hose and nozzle. In tests 9, 12, and 13, a large orchard sprayer delivered the spray by means of two 50-ft. hoses and adjustable orchard guns at approximately 400 p.s.i. In the remainder of the tests, the spray was applied with a small engine-powered barrel pump, equipped with a 30-ft. hose and an adjustable orchard gun, at 150 p.s.i. In every case, the amount of fluid applied was in excess of that actually required to wet the animals thoroughly. Where the pressure was low and the majority of the pigs small (tests 1 and 4), only 1 qt. of fluid per animal was administered. Elsewhere, as much as 3 pints to ½ gal. were applied per animal, and where the large, highly-powered orchard sprayer was used, and two hoses employed, more than a gallon of fluid per animal was used.

Herds involved in tests 1, 2, 3, 5, 6, 7, 11, and 13 were sprayed and held on straw bedding; those in tests 4, 8, 9, 10, and 12 were treated on unbedded concrete or dirt floors. When pigs were sprayed on straw bedding, instructions were given owners or herdsmen to replace the wet bedding with clean, dry straw. Except in test 4, the animals were confined to the pens in which they were sprayed for fifteen minutes to an hour after treatment in order to assure prolonged contact with the acaricide. Even where no bedding was provided the advantage of permitting the wet animals to rub against each other and on the wet floor for the further distribution of the toxicant is obvious. In one instance (test 7), the pigs were held in the barn for one hour after treatment; however, when they were finally released, a light rain fell upon all but a few animals which failed to leave the barn.

Every effort was made to treat each animal adequately. A fine fog was used to wet the head, particular attention being given to wetting the inner surfaces of the external ears. Coarser sprays were used to wet the rest of the body. The toxicants and concentrations used are given in table 1.

An effort was made to determine the rapidity with which sarcoptic mites on swine were destroyed by lindane and chlordan. From heavily infested pigs selected from the herds involved in tests 1, 2, 3, and 5, skin scrapings were collected at intervals varying from one-half to two hours after treatment, and thereafter at brief intervals until no evidence of living mites could be detected. The mites were examined microscopically on the skin fragments in as undisturbed an environment as possible. Movement of the appendages was regarded as the criterion of life; when no movement whatever was detected, at a magnification of approximately 80 x, over a period of not less than five minutes, the mite was considered to be dead. The possibility of temporary intoxication of the mites was considered. For this reason, mites presumed to be dead were reëxamined approximately a day after removal to see if they had revived.

Table 1—Toxicants and Concentrations Used

Toxicant	Concentration w/w[1] (%)	Formulation[2] (%)	Quantity per 100 gal. water (lb.)
Lindane	0.1	25	3.0
Chlordan	0.25	40	5.0
Toxaphene	0.3	40	6.0
Neotran*	0.25	25	1.0[7]
	0.5	40	10.4
Aramite**	0.1	15	5.5
	0.5	15	26.6
Ovotran†	0.5	50	8.3

*Bis (p-chlorophenoxy) methane; **a product containing 2-(p-tertiary butylphenoxy) isopropyl-1-methylethyl 2-chloroethyl sulfite; †p-chlorophenyl p-chlorobenzene sulfonate; [2]wettable powders used for all toxicants except neotran, which was applied in emulsion form; [7]gallons.
[1]Weight of toxicant in weight of liquid carrier.

RESULTS

As shown in table 2, various insecticides were applied in a series of 13 tests to swine afflicted with sarcoptic mange. In all of three tests, lindane at a concentration of 0.1 per cent successfully destroyed all mites and eradicated all mange infestations. In a series of five tests with 0.25 per cent chlordan, mange lesions healed satisfactorily in four herds but not in the fifth. However, in three of these five herds small numbers of live mites were found on post-treatment examination. In a series of three tests, 0.3 per cent toxaphene suspensions promoted considerable resolution of lesions but failed to destroy all mites on several pigs in each of the three treated herds.

In one herd sprayed with 0.25 per cent neotran, lesions appeared to have been satisfactorily resolved, but small numbers of live mites survived treatment. In another herd sprayed with 0.1 per cent aramite, lesions showed only slight healing and many live mites were found on post-treatment examination.

Lindane at a concentration of 0.1 per cent (tests 1, 2, and 3) was found to destroy sarcoptic mites within five hours;

chlordan at a concentration of 0.25 per cent (test 5) destroyed sarcoptic mites in approximately six hours.

Prior to undertaking large-scale spraying of swine with certain specific acaricides, a few young pigs were sprayed with concentrations two to five times greater than those which were to be used for acaricidal purposes. No untoward effects were observed following the spraying of a 0.5 per cent neotran suspension on a 60-day-old, 35- to 40-lb., male pig; of a 0.5 per cent aramite suspension on 2, 60-day-old, 35- to 40-lb., female pigs; nor of a 0.5 per cent ovotran suspension on 2, 60-day-old, 35- to 40-lb., female pigs.

DISCUSSION

Without exception, the herds selected for the tests described in this paper could be regarded as seriously infested with sarcoptic mange mites. In seven of the 13 herds, there were 1 or more stunted and nearly moribund pigs; these made especially suitable subjects for demonstrating the therapeutic value of the materials tested. The abundance of mites on several of these particularly heavily infested animals facilitated the study of the rapidity with which the acaricides destroyed the parasites.

Since all of the tests herein reported were conducted in the same part of the country and were in all cases under the direct supervision of the authors, it is felt with some confidence that differences between tests were due primarily to the treatments employed. It should be noted that lindane at 0.1 per cent was completely successful in all three tests in eradicating mites and permitting healing of lesions. Chlordan at 0.25 per cent was similarly successful in only two out of five tests; in two of the other three tests, sufficient resolution of lesions occurred to permit the herd owner or manager to believe that success had been attained despite the continued presence of live mites; only in the fifth test was there failure to promote resolution of lesions as well as failure to eradicate the mites. Toxaphene at 0.3 per cent permitted partial healing of lesions in all 3 cases but failed to eradicate mites in each case. Neotran at 0.25 per cent permitted partial resolution of lesions but failed to eradicate mites. Aramite at 0.1 per cent was unsuccessful in control of mites and resolution of lesions. It should be emphasized that chlordan, toxaphene, and

Table 2—Results of Tests with Acaricidal Sprays for the Control of Sarcoptic Mange Mites of Swine

Test (No.)	Acaricide used*	Concentration of toxicant in spray	Swine sprayed (No.)	Duration of test (days)	Results			
					Live mange mites		Resolution of mange lesions	
					Population	Post-treatment interval	Degree	Post-treatment interval (days)
1	Lindane	0.1	200	234	None	6 hr. et. seq.	Incomplete Complete	28 80 et. seq.
2	Lindane	0.1	65	220	None	5 hr. et. seq.	Incomplete Complete	27 62 et. seq.
3	Lindane	0.1	113	55	None	5 hr. et. seq.	Slight Complete	20 55
4	Chlordan	0.25	225	236	Few	24 hr. et. seq.	Incomplete Exacerbation	114 236
5	Chlordan	0.25	85	157	None	6 hr. et. seq.	Incomplete Complete	49 157
6	Chlordan	0.25	30	155	None	7 days et. seq.	Incomplete Complete	44 155
7	Chlordan	0.25	125	28	Few	28 days	Incomplete	28
8	Chlordan	0.25	24	21	Many Many	5 days 21 days	None	21
9	Toxaphene	0.3	125	148	None Few	72 days 148 days	Complete Exacerbation	72 148
10	Toxaphene	0.3	30	28	Few	28 days	Incomplete	28
11	Toxaphene	0.3	62	30	Few	30 days	Incomplete	30
12	Neotran**	0.25	50	110	Few	24 hr.	Incomplete Incomplete	30 110
13	Aramite	0.1	175	30	Many	2 days 30 days	Slight	30

*Wettable powder, except where otherwise noted; **emulsifiable concentrate.

neotran provided control that would be acceptable under any but critical conditions of observation.

The possibility exists that some of the differences between toxicants reported in this paper were influenced by the location and type of holding equipment and by the possible retention of the toxicant in bedding. The influence of these factors, while real, could not be investigated within the limitations of this project.

If mange lesions were confined to the broad surfaces of the body, where all mites could be more or less readily and uniformly contacted by sprays, the matter of evaluating the effectiveness of acaricides would be relieved of some of its complexity. Unfortunately, on most infested animals, at least a few mites can be found somewhere on the concave surface of the auricula of the external ear. The introduction of sufficient fluid, through the medium of a spraying device, to cover this entire surface is not always easy, particularly if the spray operator is treating a large number of animals simultaneously. Indeed, the fact that sprays ordinarily perform so effectively within the external ear is rather surprising. The only toxicant which in these tests consistently destroyed mites within the ears of all animals treated was lindane.

The question of whether all sarcoptic mites have been eradicated from a heavily-infested herd, as a result of the application of therapeutic measures such as those outlined in this paper, is not easily answered. If living mites are found at any time after treatment, it can be assumed that either the acaricide or the mode of application was at fault. Field observations of this type can not be precise. It is practically impossible to locate one or a few living mites somewhere on the skin of 1 of perhaps 200 pigs. Fortunately for this type of research, sarcoptic mange is a disease which frequently progresses rapidly and in which the mites produce obvious and characteristic lesions. As the months pass, the lack of lesions gives assurance that live mites do not exist in the herd. Ideally, periodic examinations must be thorough, involving every animal without exception. The concave surfaces of all ears should be examined, if possible, and skin scrapings taken from this region routinely. The authors are of the opinion that it is completely unsafe to declare a herd of over 20 animals free of mange until at least sixty days have elapsed. In test 3, unfortunately, the herd was sold by its owner fifty-five days after treatment. For this reason, a detailed examination was made of every individual on the day before the herd was removed from the farm. Where possible, herds were held under observation for six months or more, in the expectation that minute lesions might finally become obvious. In test 9, no mites were found until the 148th day after treatment. There can be little doubt that mites had survived treatment, for reinfestation was altogether unlikely. This herd was the property of the South Dakota State College, and had been carefully isolated, under tight wire-mesh fence, from all other animals. This observation simply indicates that a few small lesions may be overlooked somewhere on 1 or several of 113 swine for as many as two and one-half months.

In test 4 (table 2), it will be noted that while live mites were found twenty-four hours after treatment, the herd was examined thereafter over a period of 236 days. This unusual procedure was conducted in an effort to study the rapidity of development of the lesions on animals on which surviving mites were found, and also to observe the spread of mange throughout the herd. The most interesting fact was that on three of six of the post-treatment examinations, composite samples of scrapings were negative for live mites. These negative examinations were made five, thirty-two, and forty-six days following treatment, and it was not until subsequent examinations that live mites were again detected. For eighty-four days after spraying, no evidence of mange could be detected anywhere outside of the ears. An examination 236 days following treatment revealed extensive lesions and live mites on a sow, as well as on 4, 4-day-old, unweaned pigs. These observations substantiate the conviction that in order for a field trial to be conclusive, post-treatment examinations must be continued for three months or longer.

Interest in the specific acaricides, neotran, aramite, and ovotran, stems from the fact that these chemicals have been highly successful in the control of various plant-feeding mites and because of their generally low acute mammalian toxicity. The

dosages of the toxicants employed in these tests were from two to three times the higher concentrations normally employed on crops. It is suspected that failure could have been due to poorer penetrating qualities of these materials, but separation of this factor from actual toxicity to *Sarcoptes scabiei* would have required analytical procedures beyond the scope of this project.

No differences in the effectiveness of the various toxicants used could be attributed to differences in pump pressures at the time of spraying, although no statistical validity is ascribed to these data. Thus, lindane was completely effective when used at 75 and at 150 p.s.i.; chlordan, in tests 4, 7, and 8, showed at least partial failure at pressures of 75 and 150 p.s.i.; and toxaphene provided only partial control of mites when employed at 150 and at 400 p.s.i.

It should be pointed out that the insecticidal action of lindane appears to be equivalent to all-isomer BHC when the latter is mixed on the basis of the *gamma* isomer content alone. The work reported in this paper should not be construed as a recommendation for lindane in preference to all-isomer benzene hexachloride for the control of sarcoptic mange of swine.

CONCLUSIONS

1) In tests involving 378 swine on three farms, single-spray treatments containing 0.1 per cent lindane in aqueous suspension destroyed all sarcoptic mange mites on heavily infested animals, and successfully eradicated the infestations.

2) In tests involving 489 swine on five farms single-spray treatments, containing 0.25 per cent chlordan in aqueous suspension, destroyed all sarcoptic mange mites in hogs on two farms, but failed to eradicate infestations in three other herds. In two of these three herds, the degree of control was high and lesions were largely resolved. In the third herd, there was an almost complete failure to destroy mites, with the result that lesions remained apparently unchanged.

3) In tests involving 217 swine in three small herds, sprays containing 0.3 per cent toxaphene in aqueous suspension failed in each case to eradicate the infestation. The degree of control obtained in each herd was, nevertheless, high.

4) A neotran 0.25 per cent emulsion destroyed most mites but did not eradicate the infestation in one herd composed of 50 animals.

5) An aramite 0.1 per cent emulsion failed to provide satisfactory control of mange mites in one herd composed of 175 animals.

6) None of the toxicants described resulted in overt discomfort or injury to any of the 1,314 swine involved in these tests.

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Atrophic Rhinitis Produced with Pasteurella Multocida

Encouraged by the fact that *Pasteurella multocida* was rarely absent from early lesions of atrophic rhinitis, as it occurs in Ontario, another attempt was made with pure cultures to produce a condition experimentally. Since more than one factor might be concerned, a filtrate was also made from the infected source. Seven pigs, 4 days old, were given bilateral nasal instillations as follows.

Two pigs were given equal parts of bacterial suspension and sterile broth; 1 of these remained practically normal except for pus in one nares, while both turbinates of the second pig were affected. Three other pigs were given equal parts of the bacterial suspension plus the filtrate from an infected pig; all 3 developed rhinitis with complete decalcification of the turbinate bones in 2 pigs. Two other pigs were given equal parts of the filtrate and broth but no bacterial suspension; both remained entirely normal. Thus the 5 infected pigs developed some typical lesion of rhinitis while the 2 controls remained normal.—*Canad. J. Comp. Med., May, 1953.*

Potassium Nitrate Poisoning in a Dog — A Case Report

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Reports of nitrate poisoning in the large domesticated animals grazing on nitrate-fertilized forage are on record, but none could be found in the veterinary literature with reference to the dog.

On Aug. 21, 1952, a 6-month-old male mongrel Terrier, weighing 12 lb., was presented with a history of vomiting and diarrhea. The owner had procured the dog one month previously and claimed that the animal began vomiting a few days after adoption. In every case, according to the owner, the food was regurgitated without evidence of digestion. Periods of diarrhea had accompanied the vomiting. In addition, there was marked urinary frequency and a compensatory polydipsia. The dog would cry out in pain several times a day, and also showed signs of psychic derangement or central nervous irritability. This was manifested at one moment by wagging the tail and expressions of contentment, with sudden changes to baring the teeth, biting, and crying in an abnormal manner.

The dog had not eaten for three days before admission. The owner stated that, the day after adopting the dog, he had given him a "saltpeter pill" to curb sexual demonstrations.

The dog appeared depressed, fractious, emaciated, and dehydrated. The mucous membranes were blanched; the temperature was 101.5 F., and deep palpation of the stomach and intestines elicited discomfort but not severe pain.

The dog was given distemper-hepatitis antiserum and placed in the hospital for observation and laboratory tests. Initial therapy consisted of subcutaneous administration of 75 cc. of isotonic saline-dextrose solution and 1 cc. of B-complex intramuscularly every twelve hours.

For two days, the animal's condition was essentially unchanged. The dog still did not eat, was extremely depressed, became vicious when approached in his cage, and no emesis or defecation occurred.

On August 22, barium studies proved negative for esophageal dilatation or gastrointestinal foreign body. Laboratory findings were of interest and revealed the following:

Hemoglobin (Haden-Hausser), 6 Gm./100 cc. of blood; reticulocytes, 6 per cent of total erythrocyte count; and total white cell count (corrected for 6 % reticulocytes), 40,000 per cubic millimeter.

Differential: segmented neutrophils, 1 per cent; nonsegmented neutrophils, 91 per cent; eosinophils, 1 per cent; lymphocytes, 7 per cent; monocytes 0 per cent.

Urinalysis: color, clear, light amber; specific gravity, 1.016; reaction pH 7.0; albumin, none; sugar, trace; indican, ++++; sediment, many white cells, few epithelial cells.

Fecal (sugar floatation): negative for internal parasites.

Since the blood analysis showed the animal to be anemic, 75 cc. of whole blood was administered intravenously in the morning and an additional 75 cc. that evening.

The high white cell count and neutrophilia would ordinarily suggest acute bacterial infection; however, the temperature had never been above normal. On the basis of the extreme "shift to the left" of the neutrophils, the presence of a number of reticulocytes, and the low hemoglobin, it was believed that the etiological agent was producing a lysis or depression of the mature blood elements, and that the hemopoietic organs were providing a good response in producing immature cellular elements as part of the body's defense mechanism. The high indican of the urinalysis only substantiated the history of a severe catarrhal gastroenteritis.

Further questioning of the owner produced the following more complete history:

Daily doses of 5 gr. of potassium nitrate had been started two days after adoption. Two days later, the dog was vomiting undigested food at intervals of five minutes to five hours after feeding. He also developed a diarrhea with light brown watery fecal material. One week later, the dog disappeared for five days, and upon his return had normal stools, a good appetite, and no longer vomited. The animal's sexual demonstrations once again prompted the owner to return to his course of "treatment." His wife began administering an additional daily 5 gr. dose and three or four days prior to presentation, the owner had increased his daily dosage to 10 gr. During this period, the animal stopped

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eating completely, bowel movements ceased, and the dog retched without food material in his stomach. The owner and his wife discontinued administration of the drug the day before presenting the dog at the hospital.

On August 24, after the previous day's blood transfusions, the patient was much brighter, ate well, had a semiformed stool, and soon became friendly and alert. He was discharged from the hospital on August 27 with a hematinic and multiple vitamins to be given daily for three weeks. An uncomplicated recovery followed.

A brief review of the medical literature indicates that similar symptoms occur in human beings thus poisoned.

In man, low toxic dosage may produce generalized weakness, lassitude, drowsiness, giddiness, headache, confusion, debility, and slowing of speech and memory. Larger doses will produce severe and sometimes fatal gastroenteritis, characterized by severe abdominal pain, vomiting, frequent and bloody stools, and tenesmus. The patients become weak and suffer vertigo, irregularities of cardiac action, and finally convulsions and collapse. They may develop dysuria and polyuria, and the urine sometimes contains albumin and blood. Potassium nitrate is the most irritating of the saline diuretics and considerable kidney damage may ensue.[1-4]

Cyanosis and functional anemia from methemoglobinemia may also result because of the reduction of nitrates to nitrites in the gastrointestinal tract.[1] Since, however, only the organic nitrates readily release the nitrite ion in the body, potassium nitrate does not produce appreciable nitrite action unless taken in extremely large doses. Severe poisoning and even death have been reported in a number of infants from nitrite-induced methemoglobinemia, resulting from the administration of an antidiarrhea powder containing bismuth subnitrate.[5] The same should hold true, to some extent, for potassium nitrate in the dog.

With potassium nitrate, in addition to the acute symptoms of gastroenteritis and psychic disturbance, prolonged exposure to small amounts may lead to anemia with easy fatigability, low blood pressure, and mild nephritis.[6]

Windmueller has reported a case of chronic poisoning in a farmer who took daily doses of 10 Gm. for twenty-six days. He became emaciated, weakened, and anemic (hemoglobin 50%; erythrocyte count 290,000). Before death, there was albuminuria and suppression of urine.[7] When the drug was popular as a diuretic,[8] the dosage for man was 5 to 10 gr. daily.

For a 12-lb. dog, Lentz gives the dose as approximately 3 gr. a day for only a few days.[8] It can thus be seen that the case here described was one of chronic saltpeter poisoning similar both in time incidence and symptomatology to that of the farmer.

In man, on postmortem examination, the mucous membrane of the stomach is bright red or brownish-red. The vessels of the stomach wall are hyperemic. The blood is fluid and seems hyperoxygenated, becoming a brighter red in color.[4] Varying degrees of inflammatory change would be expected in the kidneys, dependent upon dosage and time of exposure to the drug.

The treatment of acute nitrate poisoning consists of gastric lavage or emetics, and the administration of demulcents and of large amounts of fluids to enhance the urinary excretion and prevent dehydration. The alleviation of the methemoglobinemia by the intravenous injection of methylene blue (1 to 2 mg. per kg. in man) has been suggested. Otherwise, treatment is symptomatic.[1]

In the above-described case of chronic poisoning in the dog, it is felt that the blood transfusion played the biggest role in effecting recovery. In addition, supportive therapy of multiple vitamins, parenteral fluids, intestinal sedatives and demulcents, and hematinics should be instituted.

SUMMARY

A case of potassium nitrate (saltpeter) poisoning in a dog has been presented. The symptomatology, clinical-pathological findings, and treatment are described. Brief mention is made of pertinent material concerning saltpeter poisoning in man.

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Piroplasmosis in a Dog

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Piroplasmosis in dogs, common in other parts of the world, is seldom reported in the United States and has not been reported from Virginia. Because of its apparent rarity, a case recently seen in a dog in that state is described here.

A black and tan male Coon Hound, 2½ years old, 32 inches high and weighing 36 lb., was presented for examination on Aug. 4, 1952. The hound had been in good health until July 28, 1952, at which time his weight was estimated at 55 lb. The owner first noted that he would not finish his usual amount of feed and was listless and indifferent to his environment. The weight loss and dull coat became progressively evident. The dog vomited about twice a day, drank water copiously, and usually refused food. The owner had not noticed any other symptoms.

Examination of the dog revealed dehydration and cachexia. His attitude was listless, and he was indifferent to his environment. His gait was slow and stiff. The coat was dry and shedding. Ticks were present. The mucous membranes were severely anemic and slightly icteric. The temperature was 101.6 F., pulse 132, respirations 45 and labored. The feces were soft, but not loose, and of tan color; the urine was thick and dark yellow.

Fecal examinations were made by the direct smear and sugar flotation methods; no parasitic ova were found. Nutritional anemia was considered unlikely because of the healthy condition of 7 other dogs being fed in the same way by the owner. Blood was drawn and smears were prepared and sent to the laboratory for Giemsa stains, along with a tentative diagnosis of piroplasmosis. This was confirmed by the finding of Babesia sp. in the red cells. An unfavorable prognosis was made.

Fifty cubic centimeters of whole blood was drawn from a Cocker Spaniel donor and administered immediately. The diagnosis of the blood smears was completed within three hours. None of the drugs recommended for the treatment of piroplasmosis, such as trypan blue, could be obtained; I was informed that trypan blue was no longer being manufactured. The only antiprotozoal drug that was available was carbarsone (Lilly) (p-carbamino phenyl arsonic acid). One 0.25-Gm. tablet of this was administered orally three times a day for ten days. Supportive therapy consisted of multivitamin capsules, iron-copper-strychnine-arsenic compound tablets, 5 per cent dextrose solution, good nutritious food, and six more 50-cc. blood transfusions over a six-day period.

The hound started eating on the second day of treatment and gained 10 lb. in the next ten days. The temperature remained within normal limits throughout this period. When discharged, he was active and appeared to be in good health. Blood smears from a sample drawn at this time still contained a few Piroplasma organisms. The hound was returned for another blood examination ten days later; no Piroplasma were present in the blood smears at that time.

Cases of canine piroplasmosis in this country have been reported from Florida[2,3] and New York.[1] The latter case was in a dog that had spent some time in Texas. To my knowledge, this disease has not previously been recorded from Virginia. Since the disease may be more prevalent than is at present suspected, it would appear that blood smears should be examined in all cases of anemia, especially where parasites have not been found on fecal examination and if the dog is harboring ticks or has been in a tick-infested area. The success of the carbarsone therapy is of interest, since this drug was developed primarily for amebiasis rather than for other Protozoa.

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Dr. Grogan is a practitioner in East Meadow, N. Y. This case was diagnosed by Dr. Grogan when he was practicing in Warrenton, Va.

Too much heat should not be used on an animal suffering from shock. Chilling must be prevented but heat will further expand an already over-relaxed superficial circulation.—*C. E. Hofmann, D.V.M., Tulsa, Okla.*

Examination of Commercial Silver Fox as a Possible Host for *Echinococcus Granulosus* (Batsch 1786) Rudolphi 1805 in Salt Lake County, Utah

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THE INVESTIGATION into the intestinal helminths of selected commercial Silver Fox populations was initiated as a portion of a study of the epidemiology of the hydatid worm, *Echinococcus granulosus* (Batsch 1786) Rudolphi 1805, in northern Utah. The adults of this tapeworm species inhabit the small intestines of the various species of Canidae and have recently become of local importance because of the appearance of hydatid cysts, produced by the larval form of this species, in a number of human surgical cases in this area. Such cases contracted within the borders of the United States are rare. Medical records to the year 1937 list only 29 such cases, although this figure may be somewhat inaccurate because the reporting of cases of this type is not generally required. Eleven additional cases were reported between 1937 to 1948 when the first cases appeared in the Salt Lake City area.

Carlquist and Dowell[1] reported on 6 cases occurring locally of which 4 were definitely contracted in Utah. Three additional cases occurred after this report. Since several of these were children of grade school age or younger, and within the limits of Salt Lake City, the authors were prompted to examine a sample of 200 dogs, including the pet of one of the children.[2] Adult Echinococcus were not recovered during this investigation. However, the domestic dog is still considered the most likely source of infection for the human cases reported. Because several of these human cases resided in communities where Silver Fox were being raised, and because 1, a 12-year-old boy, had a pet fox as well as a cat and dog, a study of the fox population seemed to be indicated.

METHODS

The study of the intestinal helminths of the fox included both a laboratory investigation of the stools of a number of animals for ova, and the subsequent close inspection of the intestinal tracts from freshly killed animals. Stool samples were collected from 37 animals over a three-day period. They were obtained naturally by picking up the fox, which induced defecation. Samples were collected individually in sputum cups for transfer to the laboratory where each specimen was examined via three methods. Several direct thin films or wet preparations of each were made and examined. Concurrently, each sample was subjected to flotation using the Willis-Malloy sodium chloride levitation-concentration technique. In addition, a portion of each sample was subjected to concentration by means of centrifugation, a method designed to recover operculated ova should these be present.

A group of 83 intestinal tracts of commercial Silver Fox were collected from these fur farms and examined for helminths. This number included many of the animals from which stools had been examined previously. The intestines were removed from the animals as soon as possible after they had been killed for pelting. Those that could not be examined fresh were preserved in 10 per cent formalin. The entire intestine from the juncture with the stomach to the anus was opened, beginning at the pyloric end. The gut contents were collected and carefully examined. The gut, as it was opened, was rolled on a hemostat to expose its inner surface and to make minute inspection possible. A four-power hand lens was used to inspect the inner lining and, at intervals of 8 to 10 inches, a section was removed and examined under a dissecting microscope. It is believed that these measures would have revealed the tiny Echinococcus adult if it had been present.

RESULTS AND DISCUSSION

Of the 37 stool samples tested, two were positive for ascarid ova. No ova of tapeworms were recovered. The examination of the 83 intestinal tracts revealed six infected with *Toxocara canis* Stiles 1905, but no evidence of other species of helminths. *Toxocara canis* infection is transferred through contamination of food and drink with mature ova which probably infect the soil of the pens and runs of the farms. It is known that the ova are resistant to all conditions except sunlight and excessive desiccation.

The food being used at the fur farms was a standard mixture of ground horse

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meat, crushed bone, ground figs, and a special Kellogg cereal fox food. A ration of this type is not conducive to transmission of ascarid infection or of the tapeworm species inhabiting the fox, with the exception of *E. granulosus*. There is a possibility that flesh other than that from the horse might be used in the formula, and thus enhance chances for tapeworm infection. The horse has been reported infected with the hydatid cysts of *E. granulosus*, but such infection is rare. Several cases of the so-called "*Echinococcus multilocularis*," due to infection with the larval stages of *E. granulosus*, have been observed in the liver and lungs of cattle coming to slaughter in this area, with occasional similar conditions in sheep. Cases observed in cattle showed the typical histological structure of the hydatid cyst, but were sterile in all of the material examined.

A further source of infection for foxes may be the flesh of wild rabbits which is occasionally fed in considerable quantity during rabbit drives in this area.

The number and distribution of the human hydatid cases, with at least 4 restricted to the limits of Salt Lake City, seem to indicate that the domestic dog is the probable host of the adult Echinococcus although none was recovered from the limited number of dogs examined. The infection in the dogs could be sparse and scattered. Futhermore the dog remains infected with the adult for only about six months. The human cases showed from the size of the cysts that infection had been of at least several years standing.

The ration of the domestic dog seemed unlikely to contain infected offal from slaughterhouses. Perhaps wild rabbit flesh and flesh of other animals not subject to inspection may contain infective material. It is also likely that some animal, possibly a rodent, may act as the intermediate host, since city-bred dogs would have access to animals of this type. The work of Rausch and Schiller[3] with the Arctic Fox and vole in Alaska indicates the feasibility of this idea. Local rabbits, gophers, ground squirrels and rats, therefore, are being investigated.

SUMMARY

A survey was made of the helminths of the Silver Fox population in Salt Lake County, Utah, to determine if the fox was the definitive host for *Echinococcus granulosus*, the hydatid worm of man and many domestic animals, which have occurred in northern Utah. Stool samples from 37 animals were examined, with two being found positive for ascarid ova, presumably *Toxocara canis*. The intestinal tracts of 83 foxes were examined, with six being found positive for *T. canis*. No tapeworms were recovered. Food being used for the foxes consisted of horse meat, and occasionally wild rabbit flesh, which could be a source of infection for *E. granulosus* but not for the nematode found. The possibility of a domestic dog-rodent reservoir in the local area is discussed.

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Fox Encephalitis in Norway

Outbreaks of fox encephalitis, never previously observed, occurred on four fox farms in Norway. An experiment on transmission of contagious canine hepatitis from a dog to foxes produced typical fox encephalitis, and fox encephalitis virus produced typical contagious canine hepatitis in dogs.

Specific contagious canine hepatitis serum from Sweden, specific fox encephalitis serum from Sweden, and specific encephalitis serum from the United States all afforded protection against the infection.

The lesions produced in foxes more nearly resembled those produced in dogs than was hitherto assumed.—*Vet. Bull., Nov., 1952.*

Immunizing dogs against canine distemper with live virus plus antiserum has never been successful in this country; giving the antiserum thirty minutes before the live virus seems to prevent the vaccinated animal from spreading the virus.—*H. C. Stephenson, D.V.M., Ithaca, N. Y.*

Photosensitization Keratitis in Young Goats Following Treatment with Phenothiazine

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Photosensitization attributable to phenothiazine has been reported in man,[6] swine,[1,9,11,12] cattle,[2,7,8,13–16] sheep,[8,10,14] and pheasants.[5] The condition is only rarely encountered in sheep and, in so far as we are aware, it has not been reported in goats. The symptoms and lesions vary somewhat in the different species but, for the most part, the eyes seem to be most commonly affected. The reaction in man, however, is primarily a dermatitis characterized by hyperesthesia, hyperemia and, occasionally, edema; the condition simulates common sunburn in many respects. It may be noted parenthetically that this reaction has been experienced by one of us (G.E.W.) on several occasions following the preparation of phenothiazine suspensions and subsequent exposure to sunshine.

The Toggenburg goat herd of the Animal Husbandry Division, comprised of about 60 adults and 28 kids, was treated with a suspension of phenothiazine about 2:00 p.m. Wednesday, April 22, 1953. This herd has sustained losses from parasitism in recent years despite periodic treatment with individual doses of phenothiazine and its maintenance on a low concentration, free-choice phenothiazine-salt regimen. The adults received 25 Gm. and the kids, 3 to 10 weeks of age, about 12 Gm. The adults were returned to pasture immediately and exhibited no adverse reactions to the treatment. The kids, which had been housed continuously since birth, were turned outside on the following morning, a bright, sunny day, about eighteen hours after medication. Friday morning, about forty-two hours after treatment, the attendant reported that several of the kids appeared to be blind. Examination of the group revealed bilateral conjunctivitis, lacrimation, photophobia, edema of the eyelids and periorbital skin, and opalescence or opacity of the cornea. The severity of the reaction varied among the several animals, but there was no apparent correlation between the age of the kids and the degree of susceptibility. The condition appeared to be slight in 6, moderate in 3, and severe in 6; the other 13 were apparently unaffected.

No specific medication seemed necessary, but it was suggested that the animals be kept out of the sunlight for a few days. The kids were next seen on Monday, five days after treatment. At this time, the lesions had disappeared from all but 3 kids in which photophobia and lacrimation persisted. Definite improvement was noted in the latter on the next day, however, and the kids were turned out of the barn. Wednesday morning, one week after treatment, all animals were apparently normal.

An investigation by New Zealand workers[3,4,16] of photosensitization keratitis in calves following treatment with phenothiazine seems to have established the following pertinent items: (1) symptoms and lesions develop only when the animals are exposed to bright sunshine; (2) the critical period of exposure is between twelve and thirty-six hours after treatment; (3) as little as one hour of exposure may produce severe trauma; and (4) the condition can be prevented by protecting the animals from bright sunshine, particularly on the day following treatment.

These workers determined that the photosensitizing agent is phenothiazine sulfoxide, a common oxidation product of phenothiazine in the alimentary tract. This substance is absorbed into the portal blood, converted in the liver to leukophenothiazone and, after it is conjugated to form leukophenothiazone ethereal sulfate, it is excreted in the bile and urine. When the conversion of sulfoxide to phenothiazone is incomplete, however, the sulfoxide reaches the systemic circulation and appears in the aqueous humor. As a consequence, keratitis and other lesions develop when the animal is exposed to bright sunshine during the aforementioned critical period. In this connection, it has been found that young animals are less efficient than older stock in converting the sulfoxide to phenothiazone and that calves are less efficient than sheep in this respect.

Investigations by DeEds and co-workers[6] suggest that the reaction in man, as in animals, is occasioned by the peculiar detoxication of the chemical within the body, especially since they found that phenothia-

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zine applied locally caused neither irritation nor predisposition to sunburn. Indeed, a coating of phenothiazine afforded protection against the development of hyperemia. Presumably, veterinarians may accidentally ingest or inhale the powder during the preparation of suspensions; and there could also be absorption from exposed mucous surfaces. This suggests the desirability of protection by suitable masks, clothing, and covering ointments.

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Husk — Atypical Pneumonia

"Husk" is a British term for a pulmonary condition in calves, usually considered to be caused by lungworms. Recent work at the Glasgow Veterinary School indicates that it is not caused by parasites. While the exact cause has not been determined, it is similar to types of virus pneumonia which are found in mice, rats, guinea pigs, and swine. All ages, from calves a few weeks old to milk cows, may be affected. It affects calves 3 to 12 months old most severely. Symptoms appear about fourteen days after exposure.

On one farm, in 1951, all 23 calves were affected and died; in 1952, after several had died, the rest were moved to a pasture. Those which died indoors were practically free of parasites. Most of the others died later, on pasture and, by then, they revealed severe parasitic infestations. Three calves 1 day old, placed in the infected pen, developed clinical signs of the disease before they were 3 months old.

This pneumonia is characterized by an expanding parabronchial lymphoid hyperplasia which appears microscopically, and even to the naked eye, as a parabronchial cuff. It is suggested, therefore, that it be called "cuffed pneumonia." Two cows, 14 years old, that for years had coughing attacks revealed similar lesions. They could be considered as reservoirs of infections. The disease has been experimentally transmitted through six serial calf passages. It apparently predisposes calves to serious parasitic pneumonia.—*Vet. Rec., March 7, 1953.*

Erythromycin Administration

In the July, 1953, JOURNAL (p. 44), the first sentence of the last paragraph of the article by Dr. E. Irvin Neserke on "Clinical Report on the New Antibiotic, Erythromycin," is incorrect. It should read "Erythromycin administration differs from that of other antibiotics in that it *only* may be given orally." The word *only* was omitted in the JOURNAL.

Hemolytic Disease of Baby Pigs

Hemolytic disease of the newborn due to iso-immunization of the mother by fetal red cell antigens of the Rh group is well known in human medicine and has been observed on foals. For years, serious losses of baby pigs were common on an English farm. There were usually no survivors from affected litters which appeared healthy at birth but developed jaundice the second day and died usually by the fifth day. Laboratory analyses were always negative.

Three affected litters were therefore studied from the time of birth. The serological technique of Rhesus factor work was attempted. The serum of 1 sow reacted with the red cells of the boar at a titer of 1 : 1000. Citrated blood from some of the piglets was subjected to antiglobulin sensitization. This agglutinated red cells from the pigs rapidly and completely in all samples. Apparently, the lethal maternal antibody is transferred to the pigs in the mother's milk but not *in utero*.—*Vet. Rec., May 9, 1953.*

Aureomycin Absorbed from the Udder

Twelve normal cows with no signs of mastitis were milked and into each quarter was injected an ointment containing 400 mg. of aureomycin. The cows were then milked out every twelve hours and blood samples were taken at intervals, increasing from one to twelve hours, until the sixtieth hour. A bacteriostatic concentration of aureomycin was found in the milk for forty-eight hours. The drug could also be detected in the blood, with the peak concentration occurring at about the twelfth hour.—*J. Dai. Sci., Feb., 1953.*

Peculiarities of the Platypus

The duck-billed platypus of eastern Australia is the world's strangest mammal. While its snout and web feet resemble those of a duck, its tail that of a beaver, and its claws that of a dog, it also lays eggs. As its bill is soft and leathery instead of hard, its only weapon of defense is said to be a claw on one hind leg (on males only) which secretes a poison. It lives along rivers, eats tadpoles, worms, and small fish, and is protected by law.

Before laying eggs, usually two about 1 inch long, the female burrows deep into the river bank, building barricades of dirt behind her to keep out the water. She then lays her eggs, curls her flat tail around them, and sleeps for about two weeks. When the babies are hatched, the mother awakens and suckles them just like other mammals.—*Dai. Goat J., June, 1953.*

Killing Resistant Flies

Common flies have apparently built up resistance to methoxychlor and lindane residual sprays just as they previously did to DDT. However, these resistant flies can be killed by a new type of pyrethrum space spray or by organic phosphate baits. The killing power of the small amount of pyrethrum in the newer sprays is boosted by a synergist. The frequency required of such sprays may vary from twice a day to once a week.

The organic phosphate is mixed with molasses or other bait and spread in places where it will attract flies which it kills within thirty seconds. Tests on 25 generations of flies give no evidence that they are able to build up a resistance to these agents.—*Country Gentleman, July, 1953.*

Parakeets

The parakeets known as Budgerigars, or usually just as "budgies," are achieving tremendous popularity because of their value as a pet. One enthusiast predicts that in this country they will soon surpass the canary, the dog, or the cat in popularity. His reasons are: (1) Budgies are colorful, inexpensive, hardy, and adapted to the smallest homes or apartments; (2) practically every person has been intrigued by birds from the parrot family — just as a monkey resembles man physically, the parrot family has paralled man in its talking ability; (3) the budgies have a therapeutic value which is difficult to explain. All members of the family are interested in, and become enthusiastic about, such pets.

Their popularity has been hindered by the myth that as love birds they live best with two in a cage. The truth is that when paired they are at their worst as pets. Guaranteeing that they will talk is like guaranteeing that a pup will do tricks. The performance will depend on their training, the method used, and the patience of the owner.—*All Pets Magazine, Feb., 1952.*

NUTRITION

The Pathology of Experimental Hypovitaminosis A in Young Dairy Animals

An Abstract

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Fifty-four dairy calves were raised on a ration of limited whole milk, dry calf starter, and hay until 105 days old, except for 5 which were raised until 63 days old. At that time, all animals were placed on a ration deficient in vitamin A. Six control calves were fed 107,143 U.S.P. units of vitamin A daily. Twenty calves were depleted to 4 μg./100 cc. or less of blood plasma vitamin A and slaughtered after two weeks at that level. Four were killed after seven weeks at that level. Of 8 other depleted calves, 4 received intravenous injections of carotene in 9 per cent "tween" 80 at the rate of 120 μg. per pound for six days, while 4 others were given carotene *per os;* all 8 were slaughtered fourteen days after the six-day treatment. Six other depleted calves were given 2 Gm. of ascorbic acid per day subcutaneously for fourteen days and slaughtered. Finally 10 depleted calves were given 200,000 U.S.P. units of vitamin A *per os* daily; 6 were killed in two weeks and the remaining 4 in four weeks.

Observations consisted of making clinical and ophthalmoscopic observations, measurements of spinal fluid pressure, and histological examinations. Diarrhea and incoördination were consistent aspects of vitamin A deficiency in calves. Cases of pneumonia occurred but without statistical correlation to depletion. Papilledema was a significant but inconsistent ophthalmoscopic observation. Spinal fluid pressure was measured with the calf in the standing position: An assistant grasped the animal's ears and the operator introduced an 18-gauge, 3-inch needle in the direction of the atlanto-occipital space, moving the needle a few millimeters at a time. Piercing the dura mater usually gave a definite snapping sensation and was followed by spinal fluid welling or spurting up through the needle. A plastic insemination tube with a 1-mm. bore was then adjusted to the hub of the needle and the lowest point of the pulsating column of fluid measured. A pressure below 125 mm. (counting 90 mm. for the needle) was considered normal while readings up to 200 mm., exceptionally 500 mm., indicated deficiency.

Histological study of 10 per cent formalin-fixed tissues revealed squamous metaplasia of the interlobular ducts and the main duct of the parotid gland in all but 1 of the deficient animals, and was considered pathognomonic. Similar alterations have been seen in bovine hyperkeratosis; probably on account of the associated antivitamin A effect of hyperkeratotic factors. Focal necrotic hepatitis was far less frequent (22%) but was seen only in deficient animals. Histological changes in the adrenal glands, intestinal tract, kidney, testis, thyroid, and pituitary glands did not occur in specific relation to hypovitaminosis A.

Supplementary carotene for one week failed to reverse the pathognomonic lesions of the parotid gland although it did ameliorate diarrhea and incoördination. Ascorbic acid failed to produce any improvement. Vitamin A feeding for two weeks induced partial reversal of the squamous metaplasia of the parotid gland ducts and complete reversal in four weeks. Spinal fluid pressures were markedly reduced and symptoms disappeared when vitamin A was fed.

On the basis of this study, measurement of the spinal fluid pressure in the field with the simple instruments described, and histological examination of parotid glands and ducts from slaughterhouse specimens, should materially contribute to the differential diagnosis of hypovitaminosis A in cattle.

This is an abstract of the manuscript entitled "The Pathology of Experimental Hypovitaminosis A in Young Dairy Animals," by the above authors, which was published in the July, 1953, issue of the "American Journal of Veterinary Research," pp. 343-354.

The turkey feed bill can be cut 15 per cent by sowing rape in a few acres of corn and letting the turkeys "hog it down".—*Farm J., June, 1953.*

Protein Values of Cottonseed Meal

A biological study of the protein values of three cottonseed meals and one cottonseed flour was made on the Albino rat. The greatest protein efficiency was exhibited by the solvent-extracted meal which had no heat treatment, whereas the flour which had the most heat treatment showed the poorest protein efficiency. The amino acids, lysine and methionine, apparently had been partially destroyed in processing. These studies may stimulate the commercial production of improved cottonseed meals.—*J. Agric. and Food Chem., April, 1953.*

Antibiotics, Vitamin B_{12}, and Fat

Aureomycin and B_{12} produced only additional fat when added to the ration of mice. At the University of Georgia the effect was negative on the females but the males developed more body fat, with an accompanying decrease in body moisture and nitrogen content.—*J. Agric. and Food Chem., June 24, 1953.*

Report on Hyperkeratosis Conference

The National Technical Committee on Bovine Hyperkeratosis, with 12 states represented, met in State College, Pa., May 4 and 5, 1953. They reported that highly chlorinated naphthalenes are the only compounds believed to produce hyperkeratosis in cattle. These highly chlorinated naphthalenes are valuable in certain high-pressure lubricants used for special purposes. A very small quantity will produce the disease, as is indicated by the large number of cattle poisoned by eating pelleted concentrates accidentally contaminated with lubricants. The disease may be acute or chronic, depending upon the amount of the compound consumed, and perhaps on other factors.

Feed-processing companies should demand a warranty from the grease manufacturers that their lubricants do not contain chlorinated naphthalene. Livestock should be kept away from machinery so they can neither lick nor rub on lubricants. There is no chlorinated naphthalene in any insecticides produced in this country, for use on livestock or livestock forage, nor in commercial wood preservatives made in this country.

Some lubricants which do not contain chlorinated naphthalenes will produce a local irritation and thickening of the skin of cattle if frequently applied, but this is not hyperkeratosis. No effective treatment for hyperkeratosis is known. Research continues on the chemical reactions which occur in body tissues and for other harmful substances which might cause hyperkeratosis.—*U.S.D.A.*

Nutrition and Reproduction

In a study involving 787 cows and heifers in a period from October 1 to March 31, it was concluded that reproductive efficiency was no higher during the early months—when the vitamin D reserves should be high—than it was during the later months.

Also, when the vitamin D status was high, phosphorus appeared not to influence fertility; but when vitamin D status was low, an increase in phosphorus intake led to improved fertility.—*Vet. Rec., Jan. 10, 1953.*

Vitamin B_{12} Concentrate from Sewage Waste

A Chicago engineering firm plans to build a plant to extract vitamin B_{12} from milorganite, the dried disinfected sludge from the sewage disposal plant. It should yield about 1 kg. of B_{12} for each 500 tons of processed fertilizer. It will be marketed for supplementation of animal and poultry feed, either as a 40 per cent aqueous solution or as a dried powder.—*J. Agric. and Food Chem., June 24, 1953.*

Dietary Fat Impairs Reproduction

The place of fat in the animal diet is receiving considerable attention. Some replacement of carbohydrates by fat increases the efficiency of food utilization. The influence on reproduction and lactation of a high carbohydrate ration compared with a high fat ration was studied in three generations of rats over a two-year period.

Sucrose had a favorable effect on lactation but the advantage was lost when it was replaced by dextrin. The high fat diet had an adverse effect on reproduction, resulting in slightly smaller litters and 10 per cent less weight gain up to twenty-one days.—*Nutr. Rev., May, 1953.*

EDITORIAL

Where and What Is Hemorrhagic Septicemia?

The progress which has been made in veterinary science, as in other sciences, in the past few decades is remarkable and is well documented.

If today one would rise to discuss such diseases as puerperal apoplexy, or lampers, or garget or contagious abortion, all of which once were accepted diagnoses, would we just smile or would we be a bit embarrassed?

About sixty years ago, what had been called puerperal apoplexy was modernized by being termed parturient apoplexy. More recently, it has become known as milk fever, hypocalcemia, or parturient paresis. The difficulty in deciding on a name for this condition is understandable because, while the disease may not have changed, theories regarding it have; yet it still is an incompletely solved mystery and is treated rather empirically.

The term "bovine contagious abortion" about thirty years ago gave way to "Bang's disease," then several years later to "brucellosis," a term which it seems is being widely accepted. Similar changes have occurred in human medicine, such as when the inappropriate term "consumption" was abandoned for "tuberculosis." These incidents illustrate the fate of the names of many diseases. The diseases change little but obviously their names were changed as research revealed new facts and theories concerning them. These were signs of progress.

However, this progress in terminology has not been universal. It has been strangely absent in the case of the popular but questionable diagnosis of "hemorrhagic septicemia." The origin or age of that term we do not know but about 1886 a microorganism found in the tissues of animals showing septicemia and tiny hemorrhages was given the name "*Bacterium septicemiae hemorrhagicae.*" However, only a year later, "Pasteurella" was adopted for this same microörganism since Pasteur had, in 1880, described it as the cause of fowl cholera.

Being relatively ubiquitous, Pasteurella organisms were recovered from a great variety of disease specimens and quite naturally were suspected of being responsible for many of the diseases. As a result, hemorrhagic septicemia became a greatly overworked diagnosis. Because of its euphonious name, it was a popular diagnosis with the laity and, seemingly, because its diagnosis required little mental effort, it was popular with the profession. Any autopsy revealing petechial hemorrhages could be conscientiously diagnosed as hemorrhagic septicemia.

Pasteurellosis Preferred

Because of the inadequacy of the term "hemorrhagic septicemia" pasteurellosis was proposed more than fifty years ago for all disease conditions caused by Pasteurella organisms. The two terms were synonymous but one was based on the specific etiology, while the other was based on inconstant symptoms and lesions and, therefore, was often inaccurate. Yet the inaccurate term still persists.

"Pasteurellosis" was proposed a score of years before "brucellosis." Why then is the obsolete terminology for brucellosis so readily abandoned while relinquishing the obsolete antecedents for pasteurellosis so stubbornly resisted? May we suggest that there are probably two chief reasons: (1) confusion and (2) indifference to what might be called literary squatters' rights.

While the progress made in research on still current diseases, such as brucellosis, has usually been distinctly positive, often necessitating more specific terminology, the progress made with the supposed pasteurelloses, except in birds and laboratory animals, has been largely negative. In other words, in almost every instance where the various forms of so-called hemorrhagic septicemia of domesticated mammals have been subjected to research, it has proved either that Pasteurella organisms were in no way responsible for the condition or that they were merely secondary invaders. As a result, these diseases have been dissociated

from the pasteurellosis category and have been given completely unrelated names.

DISCREDITED DIAGNOSES

We need but recall that twenty or thirty years ago there was supposed to be at least four types of hemorrhagic septicemia in cattle: (1) septicemic; (2) enteric; (3) nervous; and (4) pulmonary.

It is enlightening to review the status of some of those bovine types or forms today.

1) The *septicemic* form, which occasionally occurs sporadically, just as does salmonellosis or streptococcosis, was largely eliminated when such classical clinical examples as "cornstalk disease" proved to be due to a poison.[1] Similarly other conditions, many of which were supposedly confirmed by finding Pasteurella in the tissues of the dead or dying victim, were actually poisonings, as demonstrated in Florida by Sanders[2] in 1937. It now is realized that many other poisonings, deficiencies, and non-Pasteurella septicemias had regularly been clinically diagnosed as the septicemic form.

2) The *enteric* form at one time was diagnosed clinically on almost all occasions when hemorrhage occurred in the feces. However, since Wilson,[3] in 1931, reported the prevalence of bovine coccidiosis, little has been heard of this form.

3) The *nervous* form was classically exemplified by "mad itch," but Shope,[4] in 1931, found this to be pseudorabies (Aujesky's disease) caused by a virus. Nervous symptoms also occurred occasionally in other supposedly hemorrhagic septicemia cases, such as in cornstalk poisoning, as well as in metabolic disturbances, such as ketosis and hypocalcemia.

4) The *pulmonary* form is therefore the only form which might provide many cases of actual bovine pasteurellosis and, even here, there is substantial doubt about the most classical example, so-called shipping fever (*see* page 198). Admittedly, the term "shipping fever" also is unsatisfactory, since it is vague and suggests transportation as an essential etiological factor. However, we trust a better term will be adopted if and when the definite cause of that condition is proved.

If eventually shipping fever were proved to be other than a primary pasteurellosis, then where would we turn to find any but sporadic pasteurellosis in cattle?

It has been suggested that so-called shipping fever as recognized in dairy cattle in the eastern states might not be identical with that in midwestern and western feeder cattle; however, definite information on this is lacking (*see* page 204).

INCIDENCE IN OTHER MAMMALS

Pasteurellosis as it occurs in sheep (*see* page 205) is apparently quite similar to that in cattle but pasteurellosis in swine, often called swine plague, apparently is much less of a reality, although some do report it (*see* page 208).

Vigorous search for Pasteurella infections in swine during twenty years of practice in northwest Iowa was singularly unsuccessful.[5] The sporadic swine septicemias usually yielded Erysipelothrix or Salmonella or other organisms and, contrary to reports from other regions (*see* page 221), Pasteurella was often absent and rarely dominant even in pneumonic lesions.

McNutt[5] states that "Dr. L. Van Es[6] used to say there was no such disease as hemorrhagic septicemia in the lower animals except for fowl cholera. In swine this has been essentially true in my experience—I have occasionally obtained Pasteurella in specimens but have never thought that such infection was of significance in the swine industry."

The above review should denote the confusion which is partly responsible for condoning the retention of an inadequate diagnostic term. Research has removed diseases one by one from the hemorrhagic septicemia category until it remains as a nearly empty catch-all diagnosis which, in the confusion, seems to have been neglected with its label showing.

A more positive reason for the term's survival is that it has been tolerated and occasionally fostered because of its past popularity and its lingering trade value.

It would seem that a thorough housecleaning with regard to the entire subject of pasteurellosis, but of shipping fever in particular, is in order. Happily, as indicated by the research here reported from Colorado State College, such a movement seems to be under way.

SHIPPING FEVER COMPLEX

Since the fall of 1950, shipping fever has approached, if not acquired, the unenviable distinction of being the nation's No. 1 bovine killer. The inadequacy of prophylactic vaccines for this disease has long

been well documented but largely ignored.

Farley[1] and Scott and Farley,[8] in 1932, investigated thousands of cattle vaccinated with bacterins or aggressin at the Kansas City Stockyards and found that, while the difference was insignificant, actually losses were greater in vaccinated than in nonvaccinated animals. Many believed that this would not have been true had they been vaccinated a week or ten days before exposure.

We know of no documented research on the latter method but its failure to protect has often been observed. It has been reported verbally[9] that 100 Iowa calves running on pasture were twice vaccinated with bacterin at a ten-day interval before being weaned and moved into a feedlot, yet they suffered a severe attack of typical shipping fever. The same source also reported a carload of Kansas stock-show feeder calves being vaccinated three times at ten-day intervals before being weaned and shipped, yet they too developed typical shipping fever shortly after.

The inadequacy of supposedly specific antiserums also has frequently been observed but seldom reported. In 1952 the Ohio experiment station[10] found as much shipping fever in serum-treated calves as in controls, and in 1951, Palotay[11] observed an incidence of the disease of 27 per cent in 667 treated calves but only 21.8 per cent in 660 nontreated controls, symptoms appearing about five to ten days after the treatment date in both the serum-treated and untreated groups.

The prophylactic inefficiency of all biological products has become more evident since the disease recently seems to be more virulent, and were it not for the sulfonamides and antibiotics, shipping fever probably would have taken an alarming toll. Some have found streptomycin[12] to be definitely superior to penicillin as a therapeutic agent; others prefer terramycin[13].

Palotay[11] reports that Pasteurella was not found in blood cultures from 200 clinical cases and from only 40 per cent of the lungs of animals dead from shipping fever. Continuing research may soon indicate what the role of Pasteurella is in this disease. If it is the primary cause, then it should be called pasteurellosis. If it is only a secondary factor, a new name may be necessary, but in either case it surely can not justify the retention of a name so repeatedly discredited as the obsolete term "hemorrhagic septicemia." Or should we go back to puerperal apoplexy also?

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Reciprocity in Medical Licensure

Licenses to practice the art and science of medicine were granted to 13,228 physicians by 54 examining boards in 1952. Of that number, 6,212 were granted after written examination and 7,016 by reciprocity from other states or by certificate of the National Board of Medical Examiners. However, only 6,885 were receiving their first licenses as additions to the medical profession. This exceeds the number in 1951 by 1,290.

Since 3,829 deaths were reported during 1952, the net increase in physicians for the year is 3,056. The net increase in 1951 was 2,107.

It is estimated that there were 214,667 physicians in the United States on Dec. 31, 1952. Of this total, 151,363 (70 per cent) were engaged in practice; 6,677 in full-time research and teaching; 28,366 as interns, residents, and physicians engaged in hospital administration; 8,166 retired or not in practice; and 20,095 in the government service.

In 1952, these were 799 examination failures, 6 per cent of the total. They were from the following sources: approved schools in the United States, 2.7 per cent; approved schools in Canada, 7.0 per cent; approved schools no longer in operation, 50.0 per cent; foreign faculties, 46.3 per cent; unapproved medical schools, 73.3 per cent; and schools of osteopathy, 19.6 per cent.

The report indicates that 45 state licensing boards permit a foreign-trained physician to be examined under varying conditions. Twenty-six boards require full citizenship; 13 require applicants to file their intention to become citizens; and 29 require an internship in an approved United States hospital. Foreign-trained physicians are not eligible for licensure in only nine states.

The A.M.A. Council on Medical Education and Hospitals and the executive council of the Association of American Medical Colleges have compiled a list of foreign medical schools whose graduates they consider on the same basis as graduates of approved schools in the United States and Canada. The current list includes 50 schools from 14 countries.—*J.Am.M.A., May 30, 1953.*

Miseducation in Scientific Matters

The June 5, 1953, issue of *Science*, published by the American Association for the Advancement of Science, carries an article which is critical of some of the pseudoscientific propaganda which is abroad today. It states, "Today, miseducation of the public in scientific matters has become a multimillion dollar industry. As a consequence, all the means of mass communication are being turned upon the public to flood it with 'scientific facts' about chlorophyll, about cigarettes, about new drugs, about food, about one's body—indeed 'scientific facts' about almost everything vital to one's very existence.

"Unfortunately many of these scientific facts are insidiously concocted by slick advertising copywriters. More are ground out by authors of uncritical, sensationalized magazine articles. Still others are eagerly conveyed by warm, friendly voices on radio and television. Some are invented by novelists and playwrights purely as literary devices. And finally there are the scientific facts poured out by faddists, cultists, pseudoscientists, and skillfully camouflaged quacks—who sometimes become authors of best sellers."

The article tells of one man who started a campaign for honest, authentic science information and how he was repeatedly turned down for three years by 17 radio and 7 television stations but finally, in February, 1950, succeeded in launching a radio series "Science for the People" over WEVD. This is believed to be still the only regular general scientific radio program in the New York area. It now ". . . has come to enjoy the respect and coöperation of many professional science associations . . . and educators." It has ". . . consistently exposed misleading advertisements, exaggerated science articles, pseudo-scientific books, and the literature of quacks, cultists, and faddists."

WEVD has generously donated the broadcast time but for the first eighteen months, the originator took care of all the other responsibilities and expenses. A small group of enthusiastic colleagues then joined him in establishing "Science for the People Foundation" as a nonprofit organization. They are endeavoring to enlarge and expand their present program.

More power to them!

Two States Revise Psittacine Laws

Maryland's Board of Health has required that a permit to sell or breed psittacine birds must be obtained annually and records must be kept of all sales for two years. There are no restrictions on importing or exporting birds from the state.

In Connecticut, no permit is issued but persons wishing to breed psittacine birds must file a notice annually, on January 1, stating the kind, number, and location. They have adopted a law prohibiting the sale of birds which are not banded with a closed metal seamless band. Anyone can secure these bands by joining a bird club.—*All Pets Magazine, June, 1953.*

Tuberculosis Death Rate in Canada.—The Canadian Tuberculosis Association reports that the death rate from tuberculosis among Indians has steadily dropped from 662 per 100,000 in 1943 to 268 in 1951. For non-Indians the rate was 46 per 100,000 in 1943 and 22 in 1951.—*Canad. Tuberc. Bull., March-April, 1953.*

CURRENT LITERATURE

ABSTRACTS

Urease and Catalase Activities of Brucella Melitensis

Eighty-four strains of *Brucella melitensis* of smooth-intermediate colonial types were studied for differences in urease and catalase activities. The enzyme activities were low in strains from the Mediterranean Islands, North Africa, Turkey, Italy, Europe, South America, Mexico, and southwestern United States. The enzyme activities were high in strains from the central and eastern sections of the United States, where infections by *Br. melitensis* had not been detected until recent years.—*[Evelyn Sanders and Juanita Warner: Urease and Catalase Activities of Brucella Melitensis from Different Geographical Regions. Am. J. Vet. Res., 14, (July, 1953): 388-391.]*

Enterotoxemia Immunization of Lambs

Groups of 10 lambs each, 10, 20, 30, and 60 days of age were immunized with commercial type D *Clostridium perfringens* bacterin. Two of the lambs immunized at 10 days, 8 immunized at 20 days, 6 immunized at 30 days, and 10 immunized at 60 days, showed detectable antitoxin to the *epsilon* toxin of *Cl. perfringens*. In 50 per cent of the lambs showing immunity response, antitoxin was not detectable until three weeks after vaccination.—*[Louis DS. Smith and Hadleigh Marsh: The Immunization of Young Lambs Against Enterotoxemia. Am. J. Vet. Res., 14, (July, 1953): 408-410.]*

Hemoglobin Content of Peruvian Sheep Blood

A five-year study of the hemoglobin levels of sheep living at altitudes up to 15,000 feet is reported. Normal levels were established for sheep of all ages and sexes and under varying conditions: prepregnancy, pregnancy, after lambing, etc. The Fisher electrophotometer was used with the acid hematin method, all checked by iron in hemoglobin colorimetric determinations. A characteristic curve of Hb. level was noted in lambs from birth up to 12 weeks of age. Effects of the nutritional levels of the sheep on Hb. levels were studied. The effect of disease and stages of pregnancy were studied. Hemoglobin readings were made on animals brought from sea level to the altitude, and the time needed to reach normal levels for altitude was found to be similar to that observed in man. A summary of the results obtained on all age and sex groups is presented, as well as data on ewes and lambs. A table showing the average gains and losses in hemoglobin content of preparturient and postparturient ewes is presented.—*[Douglas F. Watson: Studies on the Hemoglobin Content of Sheep Blood in the Sierra of Peru. Am. J. Vet. Res., 14, (July, 1953): 405-407.]*

Replacement Therapy with a Progesterone Product

The pharmacological value of microcrystalline progesterone in an aqueous solution was studied with regards to corpus luteum replacement therapy during early pregnancy in the cow. Three of 3 cows maintained early pregnancies after corpus luteum ablation when aqueous solutions containing 500 mg. of microcrystalline progesterone were administered once every ten days. One of 2 cows maintained early pregnancy after corpus luteum ablation when aqueous solutions containing 500 mg. of microcrystalline progesterone were administered once each thirteen days. The fetus was resorbed in the remaining cow.—*[Leslie E. McDonald, R. E. Nichols, and S. H. McNutt: Replacement Therapy with a Slowly Absorbed Progesterone Product. Am. J. Vet. Res., 14, (July, 1953): 385-387.]*

Postvaccination Responses in Calves Vaccinated with Strain 19 Brucella Abortus Vaccine

Over a two-year period, agglutination and opsonocytophagic tests, as well as some hematological observations, were used to study the responses of 108 calves vaccinated intracutaneously and 108 vaccinated subcutaneously. Animals 5 to 7 months of age were given 0.2 ml. of strain 19 *Brucella abortus* vaccine intracutaneously, and those calves subcutaneously vaccinated received 5.0 ml. of the same vaccine.

Agglutinins were measurable on the fourth day after vaccination in both groups, and by the eleventh day titers had reached their peaks. Seventy per cent of the animals intracutaneously vaccinated and 18.5 per cent of those receiving the subcutaneous injections were negative two months following vaccination. At the end of six months, 97.3 per cent of the intracutaneously vaccinated heifers were negative, as compared with 64.8 per cent in the subcutaneously vaccinated group.

A marked rise in opsonins was noted on the third and fourth days after vaccination, with the peak appearing on the fifth and sixth days. Opsonins appeared and reached their peak earlier in the intracutaneously vaccinated calves. The opsonocytophagic indexes remained high for eighteen months and then very gradually receded.

Hematological studies proved to be similar in the two groups and showed a negligible variation in erythrocyte counts. A very marked increase in neutrophils was noted within twenty-fours after vaccination. Within the next forty-eight hours the neutrophils had decreased, while the lymphocytes had increased materially. This lymphocytosis persisted for seven to eight days, after which the blood picture returned to nearly normal. Other blood cells showd little variation.—[*Cornelia M. Cotton: An Intensive Study of Postvaccination Responses in Groups of Calves Vaccinated Intracutaneously and Subcutaneously with Strain 19 Brucella Abortus Vaccine. Am. J. Vet. Res., 14, (July, 1953):* 337-342.]

Vibrio Fetus Infection in Guinea Pigs

The pregnant guinea pig may be infected experimentally by the intraperitoneal, subcutaneous, intravaginal, and oral routes with *Vibrio fetus*. This organism was isolated in pure culture from the uteri and fetuses of animals which aborted. Vibrio organisms were also isolated from the nongravid uteri and gall bladders of some of the experimental animals. *Vibrio fetus* serum agglutinins were demonstrable in all animals which received oral inoculations of the organisms.

The gross pathological changes observed in infected guinea pigs consisted of endometrial hemorrhage, edema, and necrosis. The fetal organs were endematous and hemorrhagic.—[*M. Ristic and E. V. Morse: Experimental Vibrio Fetus Infection in Guinea Pigs. I. Bacteriological Aspects. Am. J. Vet. Res., 14, (July, 1953):* 399-404.]

Histopathology of Nephritis of the Dog

Studies of the pathological anatomy of the canine kidney are few and incomplete. A survey of significant lesions of naturally occurring renal disease encountered in the dog in tissues submitted for histological examination at the Registry of Veterinary Pathology (Armed Forces Institute of Pathology) indicated that 321 of 395 cases were most correctly classified as nephritis. Primary lesions of arteriosclerosis were not encountered and fatal glomerulonephritis was rare although many dogs showed benign glomerular lesions which were designated sclerosing nephropathy. The suppurative nephritides appeared to show transitional stages to chronic interstitial nephritis much more frequently than chronic leptospiral infections.—[*A. W. Monlux: The Histopathology of Nephritis of the Dog. I. Introduction. II. Inflammatory Interstitial Diseases. Am. J. Vet. Res., 14, (July, 1953):* 425-447.]

Modification of Middlebrook-Dubos Test in Johne's Disease

A hemagglutination reaction is described between ovine erythrocytes treated with a purified protein derivative of johnin and the serums of cattle sensitized with *Mycobacterium paratuberculosis* and with *Mycobacterium tuberculosis* var. *bovis*. Of 55 control cattle with negative history, 50 showed no titer, while titers of 5 ranged from 1:4 to 1:16. Serums from 10 johnin reactors showed titers of 1:32 or over, while serums of 14 others showed less titer. Fifteen cattle in infected herds had titers of 1:32 or more but did not react to intradermal johnin. Serums obtained from animals sensitized with tuberculosis agglutinated sensitized cells, indicating cross reaction; however, serums from paratuberculosis-sensitized animals tended to cause larger clumps of cells.—[*Aubrey B. Larsen, Dale A. Porter, and Thomas H. Vardaman: A Modification of the Middlebrook-Dubos Hemagglutination Test for Use in the Diagnosis of Johne's Disease. Am. J. Vet. Res., 14, (July, 1953):* 362-365.]

Serological Relationships of Ovine and Bovine Strains of Vibrio Fetus

The serological relationship of 23 ovine and three bovine strains of *Vibrio fetus*, as indicated by the production of agglutinins in immunized rabbits, have been investigated. The antigens used were suspensions in phenolized 0.85 per cent salt solution of organisms, grown on the surface of "hormone" agar to which 10 per cent of horse serum was added, incubated in an atmosphere containing 15 per cent oxygen. The ovine strains fall into four types, while the three bovine strains are of a fifth type. The majority of the ovine strains are of one type, which is sharply differentiated from the other four types. The bovine type shows relationship to two of the less common ovine types.—[*H. Marsh and B. D. Firehammer: Serological Relationships of Twenty-Three Ovine and Three Bovine Strains of Vibrio Fetus. Am. J. Vet. Res., 14, (July, 1953):* 396-398.]

Herpes Simplex Virus in the Cave Bat

A strain of herpes simplex virus (strain P38), initially isolated in rabbits inoculated intracerebrally with vesicular fluid and carried eleven years by intracerebral passage of infected rabbit brain and also carried 15 serial passages in mice by intracerebral inoculation, has been successfully transmitted to the cave bat *(Myotis lucifugus)* by the following routes of exposure: intracerebral, intratesticular, and nasal. Normal bats not exposed to the virus and employed as room controls appeared normal throughout the duration of this experiment. The virus contained in the brains of bats of the intracerebral, intratesticular, and nasal groups was confirmed to be herpes simplex virus. —[*R. L. Reagan, W. C. Day, Frances Sansone, and A. L. Brueckner: Effect of Herpes Simplex Virus (Strain P38) in the Cave Bat (Myotis Lucifugus). Am. J. Vet. Res., 14, (July, 1953):* 487-488.]

FOREIGN ABSTRACTS

Aspects of Brucellosis Control

The author submits the following recommendations for brucellosis control: The first abortion is to be regarded as transmissible and all necessary hygienic measures must be applied. Blood samples are to be submitted to the government laboratory for all breeding cattle 6 months old or older. It must be determined whether slaughter or isolation is to be applied. With regard to vaccination, if the age is less than 6 months, the produced immunity is less potent; and in animals more than 8 months old, the agglutination titer is more apt to endure. Even in the infection foci, large inoculations should be used. In animals well along in pregnancy, the risk of producing abortion is not great.—[*L. Debourg: Aspects Pertaining to Brucellosis Control. Vlaams Diergeneesk. Tijdschr., 22, (March, 1953): 64-71.*]—L.V.E.

Listerellosis in Poultry

The authors studied 2 cases of spontaneous listerellosis in poultry and undertook some experimental research on baby chicks, adult fowl, sparrows, and pigeons. Their investigations have led to the following conclusions: (1) listerellosis in poultry is always eminently sporadic; (2) baby chicks are more receptive to listerellosis than adult fowl and similar small birds must be considered as the most susceptible animals; on the other hand, pigeons are not resistant, as mentioned in the literature, but may have a latent infection, as also occurs frequently in adult fowl; (3) the determination of the origin of Listerella is not easy. Probably contagion from one bird to another occurs very rarely; on the other hand, infection through the egg may not be excluded; (4) typical symptoms are never observed in listerellosis of poultry. Acute evolution may provoke septicemic lesions, and slower evolution necrotic foci as well as lesions at the myocardium. Latent infections seem to be more frequent than previously supposed; this is of particular importance from an epidemiological point of view; (5) Listerella infection does not cause monocytosis in poultry. —[*L. M. G. Geurden and A. Devns: Listerellosis in Poultry. Vlaams Diergeneesk. Tijdschr., 21, (1952): 165-175.*]—L.V.E.

ACTH in the Treatment of Bovine Acetonemia

Three times at intervals of twelve hours, 50 mg. of ACTH (cortrophine) was injected into 5 cows with acetonemia postpartum. In 3 of the 5, this induced a considerable increase in the glucose content of the blood. Two did not react with a higher glucose content; 1 of these showed a normal blood content of glucose before the injection while the other had suffered from acetonemia in the two preceding years and had also reacted badly to the test applied.

Three days after the last infection, a decrease in the glucose content of the blood appeared to have occurred, but on average it was still considerably higher than before the treatment with cortrophine. The acetone body content of the blood decreased more slowly. This is in accordance with the experience of Shaw. Two animals recovered clinically while 1 animal, which had suffered from a serious acetonemia in the two preceding years, remained healthy after being treated with cortrophine before the occurrence of clinical symptoms. Two animals which had suffered from acetonemia the preceding year showed a relapse after a good clinical improvement at first. One of these had shown no increase in the glucose content of the blood when treated. The dose (150 mg.) was possibly too low while it is also possible that ACTH in the so-called alimentary form of acetonemia will give a temporary increase in the glucose content of the blood and clinical improvement, but that through the disturbances in the digestion in the rumen the chances of relapse are increased. —[*D. Talsma: A Few Tests with ACTH in the Treatment of Acetonemia in Bovines. Tijdschr. voor Diergeneesk., 78, (Feb. 1, 1953): 122-129*]—L.V.E.

Effect of Antibiotics on the Fertility of Bull Semen

Nine hundred ejaculates collected from 51 bulls were each divided into two portions and diluted with a citrate-sulfanilamide-egg yolk diluent containing streptomycin in concentrations of 1,000 and 5,000 μg. per milliliter, respectively. The results of 10,257 inseminations indicated that there was a slight, but definite, increase in the number of conceptions when the diluent contained 5,000 μg. of streptomycin. However, a study of material from bulls transmitting *Vibrio fetus* showed that there was no significant increase of conceptions when the higher concentration of streptomycin was used.—[*H. C. Adler and N. O. Rasbech: Studies on the Effect of Antibiotics on the Fertility of Bull Semen. III. Comparison of 1,000 and 5,000 Micrograms of Dihydrostreptomycin per Milliliter of Diluent, with Special Reference to the Use of Semen from Vibrio Fetus-Transmitting Bulls. Nord. Vet.-med., (March, 1953): 211-220.*] —A.G.K.

Infectious Pig Cough in Finland

In Finland, a disease characterized by cough causes serious loss among swine-feeding establishments. About 25 per cent of Finland's 233 large swine farms are affected and it is estimated that 60,000 animals became infected yearly, with a death loss of 10 to 20 per cent. The principal postmortem finding is pneumonia with consolidation of the apices and the cardiac lobe. Microscopically, the lesions are those of bronchopneumonia. A variety of bacteria have been isolated from such lesions. After a brief review of the literature, the

author describes experiments showing that the disease can be transmitted serially by the intranasal route with bacteria-free material. Five days after infection, the animals have the characteristic cough and in twelve to fourteen days consolidation of the apices and cardiac lobe can be seen. Bacteriological examination yields negative results. The virus is not the same as Shope's swine influenza virus. In a subsequent paper (Penttinen and Rislakki, *Nord. Vet.-med.*, 5, (1953): 125-130), it is reported that attempts to propagate the agent in embryonating chicken eggs were not successful, nor was it possible to demonstrate specific antibodies in serum from infected pigs.—[*V. Rislakki: The Etiology of the Infectious Pig Cough Occurring in Finland. I. Experimental Infections in Pigs. Nord. Vet.-med., 5, (Feb., 1953): 113-124.*]—A.G.K.

Pregnancy in a Mare with an Ovarian Cyst

A 15-year-old mare failed to present signs of estrus. Examination revealed a cystic right ovary. Subsequently, the mare was examined because of symptoms of colic and was found to be pregnant with a 10-week-old fetus. In addition, the right ovary measured about 13 cm. by 11 cm. by 8 cm. The animal died of incarceration of a loop of bowel in the foramen of Winslow. Necropsy revealed a pregnant uterus and a cystic right ovary containing about 200 ml. of clear fluid.—[*Jon Teige: Pregnancy in a Mare with an Ovarian Cyst. Nord. Vet.-med., 5, (March, 1953): 237-240.*]—A.G.K.

Dislocation of the Abomasum

A heifer developed symptoms of gastrointestinal distress a few days postpartum. Palpation disclosed a mass on the left side posterior to the costochondral arch. Laparotomy revealed that the abomasum was displaced beneath the rumen and extended to the left side as high as the vertebral column. A bilateral laparotomy was performed to permit replacement of the abomasum. The surgical technique is described in detail.—[*G. Kaiser and P. T. Jacobsen: A Case of Dislocation of the Abomasum. Nord. Vet.-med, 5, (March, 1953): 241-244.*]—A.G.K.

"Yellow Fat" in Mink

This condition is due to a ration deficient in vitamin E and which contains large amounts of unsaturated fats. There is subcutaneous edema and yellowish discoloration of the fat. The fat contains acid-fast pigment and evidences of foreign body reaction to the pigment. Under the microscope, the musculature presents a picture of "wax necrosis." The fat is high in iodine and rich in peroxides. The disease may be produced experimentally by feeding a vitamin E-deficient ration containing cod liver oil as a fat source. Addition of tocopherol will prevent the appearance of "yellow fat" as will also the substitution of lard for the cod liver oil. In practice, the daily administration of tocopherol, 8 mg., failed to prevent the disease when the animals were being fed fish products with a high content of unsaturated fatty acid. It is believed that there is an abnormal oxidation of the body fat leading to peroxide formation as the result of a ration rich in unsaturated fatty acids and deficient in vitamin E.

The article is illustrated by five figures (1 in color), and six graphs and tables giving the results of the extensive research. There is an English summary. [*Sv. Dalgaard-Mikkelsen, Sv. A. Kvorning, H. C. Momberg-Jorgensen, Fr. H. Petersen, and P. Schambye: Studies on "Yellow Fat" in Mink. Nord. Vet.-med., 5, (Jan., 1953): 79-97.*]—A.G.K.

Treatment of Cystic Hematuria

The disease was observed in the Stanislau region of southeastern Poland. It has been enzoötic there since before 1900 and has always been considered incurable. Of 38 cattle treated with phenothiazine, 34 recovered. There were no controls. The dose was 0.1 to 0.2 Gm. per kilogram body weight, repeated after two or three days. Five additional cases were treated successfully with a combination of phenothiazine, given in boluses, and a weak solution of iodine placed in the bladder.—[*A. A. Chubuk and V. G. Gritsenko: The Treatment of Hematuria of Cattle. Veterinariya (Moscow), 30, (April, 1953): 14-16.*]—R.E.H.

Two Diseases of the Posterior Limbs of the Dog

One case each of coxa plana or Legg-Perthes disease and Osgood-Schlatter disease in the dog is reported.

Coxa plana in dogs usually occurs during the third to tenth month of life. It is manifested by a limp that develops progressively in one or both hind legs. The case reported was a 10-month-old, male, Wolfhound. This dog had never before been ill. Lameness in the left hind leg was noticed at 3 months of age and gradually became worse. The coxofemoral joint was sensitive to palpation. A radiograph revealed a flattened head of the femur and rarefaction of the bone in the region of the neck which seemed enlarged. There was a notable increase in the joint space.

Osgood-Schlatter disease in dogs usually begins when the animal is 4 to 9 months of age. The symptoms are marked pain on palpation of the femorotibial joint and swelling of the tissues over the tibial tubercle. The animal makes few voluntary movements, prefers to remain in a stretched position, and if made to arise does so slowly and with effort. When standing, the stifles are directed outward and the hocks almost touch each other. The walk is uncertain and shaky and the hind limbs seem more flexed than normal. There is no

deformity of the forelegs or other signs of rickets. Radiological examination usually reveals the tibial crest separated from the shaft of the bone.

The author observed this disease in a male Boxer, 6 months of age which for more than ten weeks had shown fatigue and pain in the right hind limb. Since it was first noticed following trauma of the right femoral region, the condition was thought to be a subluxation of the head of the femur. Radiological examination, however, revealed it to be Osgood-Schlatter disease.—[*L. Taglia: Due malattie dell'arto posteriore del cane. Zootec. Vet. (Nov.-Dec., 1952):* 3-7.]—CARL SCHLOTTHAUER.

BOOKS AND REPORTS

The Great Dane

The book is divided into ten sections which in turn are divided into chapters. The first five sections deal specifically with the breed, and the author adequately discusses its origin, history, and development. A chapter is devoted to the traits and abilities of the Great Dane. A discussion of the breed standards and analysis of the individual dog is well done.

Two sections, which deal with the Great Dane specifically, contain general information for the fancier who is a novice. The second half discusses dog shows, preshow training, bloodlines, pedigrees, and genetics; as well as mating, whelping, litter care, feeding, housing, and training. An entire section is devoted to the anatomy, health, and diseases of the dog. The final section discusses kennel management and the business of dog management.

The first part of the book, which pertains to Great Danes specifically, is informative and well done. The portion covering dog shows, breeding, and rearing dogs is general but adequate. The chapter on diseases, in my opinion, leaves much to be desired.

This book should be of value to a novice in breeding or prospective owner of that breed of dog.—[*The Great Dane. By Virginia Keckler. 2nd ed. 175 pages. Illustrated. Judy Publishing Co., Chicago. 1953. Price* $3.50.]—G. W. MATHER.

The Essentials of Physiological Chemistry

The fourth edition of this book is primarily designed to offer the basic information in biochemistry to those with limited preparation in chemistry and biology. For this purpose, it serves very well. The book is clearly written, well organized, and enough details are included to fill the needs of the students for whom it is intended without overloading the reader with controversial information.

Its 21 chapters and 447 pages of text cover the fundamentals of the physiological chemistry of carbohydrates, lipids, proteins, minerals, enzymes, and hormones, and the chemistry of digestion, absorption, metabolism and calorimetry; also included are the chemistry of blood and of urine, a chapter on the composition of tissues and one on chemotherapy and antibiotics.

Changes made in this new edition include: a discussion of stable and of radioactive isotopes (in a chapter on biophysical chemistry); the addition of the Haworth structural formulas in the chapter on carbohydrates in view of the modern trend; rewriting the section on photosynthesis; new information on the structures of starch and of cellulose; a more detailed discussion of antioxidants in connection with rancidity of lipids; considerable change in the chapters on enzymes and on carbohydrate metabolism to include newer information; rewriting of the portions of the chapter on blood pertaining to the bile pigments and to respiration; more emphasis on the physiological actions of the vitamins (and including the newer ones such as B_{12} and folic acid); up-to-date information on the chemistry of antibiotics including penicillin, streptomycin, aureomycin, terramycin, and chloramphenicol (chloromycetin®), and on the chemistry of the endocrine secretions, particularly those from the adrenal cortex.

This book should prove useful to the students and the graduates who want easy-to-read, fundamental information on physiological chemistry without excessive details.—[*Essentials of Physiological Chemistry. By Arthur K. Anderson. 480 pages. Illustrated. John Wiley and Sons, Inc., New York, N. Y. 1953, Price* $5.00.]—CLYDE F. CAIRY.

REVIEWS OF VETERINARY MEDICAL FILMS

Intramedullary Fixation of the Femur (PMF 5196).—Sound, color, 16 mm., running time about twenty-five minutes; produced and procurable from the U. S. Army. Requests should be sent to the AVMA Motion Picture Library, 600 S. Michigan Ave., Chicago 5, Ill., so that applications may be submitted on the proper form and to the proper Army headquarters.

This film describes the indications for, and application of, the intramedullary nail in the simple, covering transverse, oblique, spiral, and butterfly types of fractures of the femur in man. Presentation is very good using radiographs, pictorial sequences, and actual surgery to demonstrate the types of fractures best adapted to pinning, selection of the pin, application of the pin and aftercare of the human patient. Some of the hazards and pitfalls of intramedullary pinning are also brought out.

The film presents a good basic idea of intramedullary pin usage but does not cover the more severe and difficult types of fractures which are encountered in a high percentage of canine femoral fractures. Also, the time factors of healing and the postoperative muscle exercises and weight bearing are not directly transposable to canine cases.—R. L. S.

THE NEWS

Dr. Harold L. Chute, AVMA Research Fellow—1952

Dr. Harold L. Chute was born in Winnipeg and received his early education in Nova Scotia. He attended the Nova Scotia Agricultural College, Truro, N.S., for two years and received a

Dr. Harold L. Chute

diploma in agriculture from that institute in 1944. At that time, he received the MacDonald College scholarship for academic achievement.

He was employed by the Nova Scotia Department of Agriculture in 1944 and worked for one year, and then intermittently until 1949, on poultry extension work.

He entered the Ontario Veterinary College in September, 1945, and graduated with a D.V.M. degree from the University of Toronto in May, 1949.

After a short period in general diagnostic work for the Nova Scotia government he accepted, in November, 1949, an appointment as assistant professor, later being promoted to associate professor of animal pathology at the University of Maine at Orono. During the three years in this position, he was engaged in research on virus diseases of poultry, diagnostic work, and teaching.

Dr. Chute was granted an AVMA Research Fellowship in 1952 and selected the Ohio State University, Department of Veterinary Pathology, for his graduate study. The following graduate courses were included in his program, in addition to research: human pathology, statistics, pathological technique, advanced histopathology, surgical pathology, oncology, and seminar in veterinary pathology. As partial fulfillment for the master of science degree, research was conducted which resulted in a thesis entitled, "A Pathological Study of Chicken Embryos Infected with Pleuropneumonia-like Organisms from Chickens and Turkeys."

This study was undertaken because of the great economic importance and need for differential diagnosis of chronic respiratory disease in chickens and infectious sinusitis of turkeys. This research consisted of studying grossly and microscopically the effects of several strains of pleuropneumonia-like organisms in chicken embryos. This study has now been completed and will be submitted to the *American Journal of Veterinary Research*. Dr. Chute has published several papers on poultry diseases.

He is a member of the AVMA, the Maine Veterinary Medical Association, the Society of American Bacteriologists, the A.A.A.S., and Phi Zeta.

After receiving his master of science degree in veterinary pathology from the Ohio State University, he will return to the University of Maine and continue with animal disease research.

Drs. S. F. Scheidy and L. M. Hutchings Elected to Executive Board in Districts II and III

As a result of the recent elections in Executive Board District II (Delaware, District of Columbia, Maryland, New Jersey, and Pennsylvania), Dr. S. F. Scheidy, Drexel Hill, Pa., was reelected for a five-year term ending in 1958. Dr. Scheidy was first elected to represent his district in 1943, was reelected in 1948,

Dr. S. F. Scheidy

and so will be serving his third term on the Board. He is director of veterinary research of Sharp and Dohme, Inc., a division of Merck and Co., Inc.

In District III (Illinois, Indiana, and Wisconsin), Dr. L. M. Hutchings, Lafayette, Ind.,

Dr. L. M. Hutchings

was elected for a five-year term, succeeding Dr. O. Norling-Christensen of Wilmette, Ill. Dr. Hutchings is head of the department of veterinary science at Purdue University and took office at the conclusion of the annual meeting in Toronto in July.

Drs. Harry W. Boothe and Erich R. Maschgan, of Chicago, served as a board of tellers to count the ballots on July 2, 1953, and certified the foregoing results.

Northeastern Pullorum Disease Conference Celebrates Twenty-Fifth Anniversary

The twenty-fifth annual meeting of the Northeastern Conference of Laboratory Workers in Pullorum Disease Control was held June 16-17, 1953, at Amherst, with an attendance of 103.

Many disease problems were discussed with much emphasis given to avian respiratory infections. Several papers on chronic respiratory disease and a laboratory demonstration on various aspects of the disease which attracted a great deal of interest were presented.

The highlight of the meeting was the twenty-fifth anniversary banquet which all attended. Dr. Ronald Gwatkin gave the main address. An outstanding feature of the banquet was the recognition and honor given to those who organized the first conference. Five of the original members, Drs. M. K. Clarke, W. R. Hinshaw, E. R. Hitchner, J. B. Lentz, and Leo F. Rettger, were present. They were presented with a certificate in recognition of their contribution to veterinary science.

When moving, advise the AVMA

Dr. Armistead Appointed Dean at Texas A. & M. College

Dr. W. W. Armistead has been appointed dean of the School of Veterinary Medicine at the A. & M. College of Texas, effective Sept. 1, 1953, to succeed Dr. I. B. Boughton who asked to be relieved of his executive duties because of ill health.

The appointment of Dr. Armistead to this position was recommended by the heads of the Agricultural Experiment Station, Agricultural Extension Service, School of Agriculture, and the vice chancellor for agriculture, and was approved by the chancellor and board of directors of the Texas A. & M. System.

Dr. Armistead received his D.V.M. degree from Texas A. & M. College in 1938, his M.S. degree from Ohio State University in 1950, and recently completed course work, residence, and preliminary examination for his Ph.D. degree. After spending two years in practice following graduation, Dr. Armistead returned in 1940 to

Dr. W. W. Armistead

his alma mater as an instructor and was later made assistant professor. In 1942, he entered the Veterinary Corps as a first lieutenant and served in North Africa and Italy. He was discharged in 1946 with the rank of major and returned to Texas A. & M. as a full professor in 1947 in the Department of Veterinary Medicine and Surgery, in which capacity he was serving at the time of his appointment as dean.

(Continued on page 254)

News From Washington

President J. A. McCallam supported the enactment of H. R. 10 (see Journal, Aug., 1953: p. 150) while appearing before the House Ways and Means Committee as the AVMA representative on August 12. This bill would authorize self-employed persons to established voluntary pension plans and to exclude from their current gross income the amount paid into a retirement fund or as premiums to an insurance company for an annuity contract. Income tax on amounts thus excluded would be payable at the age of 65, when paid out as a pension at the prevailing rates. The total amount excluded in any year could not exceed 10 per cent of the earned net income or $7,500, whichever is less.

* * *

Progress is again being made in the attempt to eradicate foot-and-mouth disease from Mexico. Dr. C. U. Duckworth, from Sacramento, Calif., who has been in Europe on a Mutual Security Agency assignment on foot-and-mouth disease, ***was appointed a special assistant to the Secretary of Agriculture*** for the development of cooperative efforts with Mexico for the eradication of the disease. A new plan for the eradication program includes (1) orderly control of all susceptible animals in the quarantine area; (2) the most practical method for evacuating animals consistent with safety in preventing spread; (3) complete disinfection of all premises when no more susceptible animals are in the area; (4) the placing of test animals on the premises in the area under the supervision of the Commission's veterinarians; (5) maintenance of strict quarantines in the infected zone and a buffer zone of about 15 miles around the infected area, and (6) vaccination of the animals in a zone of 6 to 9 miles around the infected area when vaccines are available and found safe to use.

Dr. Duckworth has returned to Europe but is retaining his position as special assistant to the Secretary of the U.S. Department of Agriculture.

* * *

Seventeen 1953 graduates of schools of veterinary medicine, who have volunteered for commissions and active duty, are being assigned by the Army. Four were from ROTC and 16 of the 17 were in Priority III of the doctor draft. The other volunteer was in Priority IV.

* * *

Colonel Ralph Mohri, V.C., replaced Colonel George L. Caldwell as assistant chief of the veterinary division of the Army Surgeon General's office.

* * *

Colonel Curtis Betzold replaces Colonel Russell McNellis as chief of the meat and dairy branch of the same office. Colonel McNellis has been transferred to 6th Army.

* * *

Major William Gochenour, Jr., replaces Lt. Colonel Karl Willers as chief of the Liaison, Standards, and Animals Branch. Colonel Willers is attending the public health course at the Army Medical Service Graduate School in Washington, D.C.

(Continued from page 252)

Well known as a contributor to veterinary publications, Dr. Armistead has served as one of the three editors of *North American Veterinarian* since 1950. He is a member of the AVMA, of Phi Zeta and Phi Kappa Phi, and is active in church and civic affairs. In 1947-1948 he served as president of the State Veterinary Medical Association of Texas.

Dr. Orr Named Dean at Oklahoma A. & M. College

Dr. Harry W. Orr, on July 1, 1953, became dean of the School of Veterinary Medicine, Oklahoma A. & M. College, at Stillwater. He succeeds Dr. C. H. McElroy, dean of the school since its establishment in 1948.

Dr. Orr received his secondary education at Mason City, Iowa, and his veterinary degree at Iowa State College in 1918. He later received an M.S. at the same school. After serving as a second lieutenant in the Veterinary Corps in World War I, and about a year in practice in Iowa, he accepted an appointment to the faculty of Oklahoma A. & M. College as assistant professor in the Department of Bacteriology, Physiology, and Veterinary Science. He was promoted to associate professor of physiology in 1923, professor of physiology in 1927, and head of the Department of Veterinary Physiology and Pharmacology in the new school in 1948. Since 1937, he has been a member of the Oklahoma Board of Examiners in the basic sciences.

Dr. Harry W. Orr

Dr. Orr is a member of many associations and fraternities, including the AVMA, Phi Kappa Phi, the New York Academy of Sciences; and he is a Scottish Rite Mason, 32nd degree. Dr. and Mrs. Orr have a grown son and daughter, both of whom live in Oklahoma.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

ALLEN, JOHN K.
1343 Mill St., San Luis Obispo, Calif.
D.V.M., Iowa State College, 1934.

BADGER, MAX G.
Rt. 54 North, Bradley, Ill.
D.V.M., Ohio State University, 1940.

CAMPBELL, WYMAN A.
P.O. Box 44, Lynden, Ont.
D.V.M., Ontario Veterinary College, 1939.

DORAN, JAMES E.
109-D Parklawn Blvd., Columbus, Ohio.
D.V.M., Ohio State University, 1950.

JOHN, CECIL E.
192 S. Main St., Kaysville, Utah.
D.V.M., Colorado A. & M. College, 1952.

NOYES, LAROY
R. R. #5, Fayetteville, Ark.
D.V.M., Kansas State College, 1918.

PELLETIER, ANDRE
498 Bureau, Trois-Rivieres, P.Q.
D.V.M., School of Veterinary Medicine of the P.Q., 1943.

SCOTT, VERNE A., JR.
364 W. Live Oak, Dublin, Texas.
D.V.M., Texas A. & M. College, 1946.

VERONI, ANTHONY D.
Box 489, Charlottetown, P.E.I.
D.V.M., Ontario Veterinary College, 1947.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

DE LOS RIOS, JORGE W.
Veterinary Section, Dept. of Animal Industry, Raleigh, N. Car.
D.V.M., University of Chile, 1948.
Vouchers: J. C. Osborne and J. G. Hardenbergh.

DE MARCOS, ISIDORE A.
Ave. Uno No. 23, San Pedro de los Pinos, Mexico, D.F., Mexico.
D.V.M., National School of Veterinary Medicine and Zootecnics, 1947.
Vouchers: A. Alexander H. and D. Mercado.
ROBINSON, ELMER L.
P.O. Box 5, Saratoga Springs, N. Y.
D.V.M., New York State Veterinary College, 1947.
Vouchers: E. P. Hornickel and G. F. Dixon.
VILLARTA, NARCISCO V.
227 Comercio St., Masilang, Makati Rizal, P.I.
D.V.M., University of the Philippines, 1953.
Vouchers: J. B. Aranez and A. C. Gonzaga.

1953 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

University of California

BAYER, EDMOND V., D.V.M.
1632 West Ave., Santa Rosa, Calif.
Vouchers: R. Vetter and J. Howarth.
BITTLE, JAMES L., D.V.M.
1642 N. Formosa, Los Angeles 46, Calif.
Vouchers: D. G. McKercher and O. W. Scholm.
COOKE, KEITH G., D.V.M.
Rt. 1, Box 269, Davis, Calif.
Vouchers: E. A. Rhode and R. Vetter.
DARROW, LEE H., D.V.M.
113 Diamond Street, Arcadia, Calif.
Vouchers: T. J. Hage and M. A. Thom.
MORTENSON, ROY K., D.V.M.
387 So. Main, Ephraim, Utah.
Vouchers: T. J. Hage and J. F. Christensen.
PIER, ALLAN C., D.V.M.
1653 Virginia Way, Arcata, Calif.
Vouchers: J. F. Christensen and D. E. Jasper.

Colorado A. & M. College

ANDERSON, ROBERT G., D.V.M.
Box 377, Columbus, Neb.
Vouchers: F. B. Kinghorn and L. K. Wayt.
ARNOLD, FREDERICK W., D.V.M.
2800 W. Northern, Pueblo, Colo.
Vouchers: J. Farquharson and F. J. Milne.
SCHEEL, EMIL H., JR., D.V.M.
1076 S. West 3rd Ave., Ontario, Ore.
Vouchers: L. K. Wayt and J. Farquharson.
SEGER, CAMERON L., D.V.M.
502 So. 24th St., Lincoln, Neb.
Vouchers: R. D. Frandson and R. W. Davis.

Iowa State College

CARLYLE, LEROY V., D.V.M.
328 W. Lapham St., Milwaukee, Wis.
Vouchers: I. A. Merchant and C. H. Covault.
DOUGHERTY, RICHARD F., D.V.M.
Wynot, Neb.
Vouchers: E. E. Grove and J. W. Giffee.
JILLSON, DALE B., D.V.M.
Elgin, Neb.
Vouchers: I. A. Merchant and C. H. Covault.
MARCUM, JACK C., D.V.M.
Spencer, Neb.
Vouchers: L. I. Hines and F. W. Thompson.
MOORE, MEREDITH H., D.V.M.
150 N. 3rd St., Medford, Wis.
Vouchers: O. W. Whitcomb and M. J. Johnson.
RUBEL, DONALD W., D.V.M.
4611 Floyd Ave., Sioux City, Iowa.
Vouchers: I. A. Merchant and C. H. Covault.
SUDHOFF, CHARLES O., D.V.M.
57 N. Washington, Danville, Ind.
Vouchers: I. A. Merchant and E. C. Jensen.
VER PLOEG, WARREN L., D.V.M.
Box 211, Brooklyn, Iowa.
Vouchers: I. A. Merchant and M. J. Johnson.

Michigan State College

BUTTS, JOHN S., D.V.M.
113 N. Keats Ave., Louisville, Ky.
Vouchers: W. O. Brinker and R. E. Brown.
DOW, RAYMOND S., D.V.M.
7401 Richmond, Detroit, Mich.
Vouchers: E. K. Sales and C. F. Clark.
HOWARD, JANET, D.V.M.
317 N. East Ave., Oak Park, Ill.
Vouchers: W. E. Lickfeldt and C. L. Miller.
TANZOLA, JAMES R., D.V.M.
1330 Pennington Rd., West Englewood, N. J.
Vouchers: R. G. Schirmer and A. C. Wheeler.

University of Missouri

MUTRUX, ROBERT A., D.V.M.
Wheaton, Mo.
Vouchers: J. E. Weinman and E. F. Ebert.
WALLACE, ROBERT D., D.V.M.
744 Lincoln Ave., St. Paul, Minn.
Vouchers: G. O. Schubert and B. L. Cook.

University of Pennsylvania

CALDWELL, DONALD B., V.M.D.
R.F.D. #1, Monongahala, Pa.
Vouchers: C. M. Hepner and W. M. Markle.
HORN, RICHARD C., V.M.D.
274 Southmont Blvd., Johnstown, Pa.
Vouchers: J. D. Beck and D. G. Lee.
RICE, SAMUEL C., V.M.D.
Rd. 2, Sharpsville, Pa.
Vouchers: E. S. Pickup and J. E. Stefanick.
SLICK, JOSEPH D., V.M.D.
725 Railroad St., Forest City, Pa.
Vouchers: J. Deubler and F. Kral.
TRUBAN, WILLIAM A., V.M.D.
135 Spring St., Woodstock, Va.
Vouchers: F. E. Lentz and J. T. McGrath.

Texas A. & M. College

CADENHEAD, PHILIP, D.V.M.
Box 673, Hempstead, Texas.
Vouchers: E. D. Waddell and F. P. McCoy, Jr.
DALOVISIO, LEONARD P., D.V.M.
1310 Ninth St., Lake Charles, La.
Vouchers: C. W. Zahn and H. E. Redmond.
MELIUS, HENRY C., D.V.M.
712 Phosphor Ave., New Orleans 20, La.
Vouchers: W. C. Banks and H. E. Redmond.
THAXTON, CURTIS L., D.V.M.
Box 551, Wellington, Texas.
Vouchers: E. D. Waddell and R. P. McCoy, Jr.

State College of Washington

BRAUNER, EUGENE J., D.V.M.
1970 Bristol Ave., Stockton, Calif.
Vouchers: H. C. Hewitt and F. H. Saunders.
LEWIS, RUSSEL G., D.V.M.
831 Lombard, Everett, Wash.
Vouchers: R. L. Ott and G. H. Keown.

Second Listing

University of California

ABBOTT, ROBERT B., D.V.M., 286 Pleasant St., Concord, N. H.
BARNIER, JEROME PIERCE, D.V.M., 870 East Baseline St., Hillsboro, Ore.
BAYLISS, JAMES W., D.V.M., Mountcrest Ranch, Hilt, Calif.
BLACKARD, JOHN SIMPSON, D.V.M., 5624 Huntington Ave., Richmond, Calif.
BRAZIL, HOLTON LIONEL, D.V.M., Route 2, Box 44, Visalia, Calif.
CHAPMAN, JOHN FRANKLIN, D.V.M., 2347-246th Place, Lomita, Calif.
CHIN WING QUONG, D.V.M., 230 Victoria Rd., Burlingame, Calif.
CLUTE, HENRY GEORGE, D.V.M., 9127 E. Ralph St., Rosemead, Calif.
CONDON, THOMAS BYRREL, D.V.M., 413 Willow Street, San Jose, Calif.
CORFF, MARVIN M., D.V.M., Davis Animal Hosp., McMinnville, Ore.
CORNELIUS, CHARLES EDWARD, D.V.M., 311 N. Santa Anita Ave., Arcadia, Calif.
CUTHBERTSON, ARLYNN A., D.V.M., 5667 North Moroa, Fresno, Calif.
DAVIES, JOHN RANDOLPH, D.V.M., Box 365, Nevada City, Calif.
DEAN, EVELYN LORETTA, D.V.M., P. O. Box 111, Sutter, Calif.
EGGERS, OTTO J., JR., D.V.M., P. O. Box 459, Davis, Calif.
EISENHOWER, ARTHUR JOHN, D.V.M., 5215 Otis Ave., Tarzana, Calif.
ERWIN, KENNETH E., D.V.M., 2703 C. St., Selma, Calif.
FOOS, ROBERT YOUNG, D.V.M., 532 J. Street, Davis, Calif.
HANSEN, JAY CLAYTON, D.V.M., 3732 Newton Road, Stockton, Calif.
HARRIS, ROBERT EVERETT, D.V.M., 230 Alabama St., Vallejo, Calif.
HOLLIDAY, TERRELL A., D.V.M., 11718 Olympic Blvd., Los Angeles 64, Calif.
HOSKER, RALPH LEO, D.V.M., P. O. Box 21, Altamont, Calif.
JACKSON, ROBERT ARTHUR, D.V.M., Rte. 1, Box 14, Davis, Calif.
KATHEIN, REUVEN A., D.V.M., 5 Radcliffe Avenue, Highland Park, N. J.
KORTUM, WILLIAM MAX, D.V.M., Petaluma Veterinary Hospital, Redwood Highway North, Petaluma, Calif.
LARSON, ROBERT FALLON, D.V.M., D 9 Aggie Villa, Davis, Calif.
LUNDBERG, BENJAMIN VICTOR, D.V.M., 523 East 8th St., Davis, Calif.
NEUSHUTZ, WALTER K., D.V.M., 115 E. Whittier Blvd., Whittier, Calif.
NEWELL, ARTHUR DEBNEY, D.V.M., 2312 Parkwood Drive, Sacramento 21, Calif.
PETTIT, GHERY DE WITT, D.V.M., F-6, Aggie Villa, Davis, Calif.
PFLOCK, JACK PAUL, D.V.M., Rt. 4, Box 95, Visalia, Calif.
PIMENTEL, WILFRED JOSEPH, D.V.M., 2386 Elm Ave., Fresno, Calif.
PRICE, LYLE DAVID, D.V.M., 6950 Reseda Blvd., Reseda, Calif.
ROOD, STERLING E., D.V.M., 1318 Kapiolani Blvd., Honolulu, Hawaii.
SILVER, MERTON J., D.V.M., E-7 Aggie Villa, Davis, Calif.
SIMPSON, ROYCE V., D.V.M., Rt. 2, Box 1248, Vista, Calif.
STEERE, JAMES HENRY, D.V.M., 1514 Washington, Oregon City, Ore.
TANGNEY, ROBERT LAWRENCE, D.V.M., 401-8th Street, Davis, Calif.
TROXELL, GEORGE SEYMOUR, D.V.M., 4950 Canterbury Dr., San Diego, Calif.
TUCKER, JACK A., D.V.M., Yreka Veterinary Hospital, Oberlin Rd., Yreka, Calif.
VAN PELT, DANIEL LEE, D.V.M., Fort Bragg, Calif.
VAN SELL, WILLIS MARTIN, D.V.M., 932 E. Philadelphia, Whittier, Calif.
VOWLES, WILLIAM L., D.V.M., 600 University Ave., Los Gatos, Calif.
WALLIS, GUY W., D.V.M., 4 Marfield Way, Placerville, Calif.
WATKINS, WILLIAM WALLACE, D.V.M., P. O. Box 352, Davis, Calif.

Colorado A. & M. College

BAGLEY, ROYAL A., D.V.M., Veterinary Science Dept., Utah State Agricultural College, Logan, Utah.
BARTON, JAMES R., D.V.M., LaSalle, Colo.
BELLING, THEODORE H., JR., D.V.M., 905 E. Laurel St., Ft. Collins, Colo.
BREEN, HAROLD, D.V.M., 611 Remington St., Ft. Collins, Colo.

BROWN, GORDON D., D.V.M., 313 Second St., Box 83, Eaton, Colo.
BROWN, JOHN D., D.V.M., c/o 5530 Vineland Ave., North Hollywood, Calif.
BURR, ROGER A., D.V.M., 2030 17th Ave., San Francisco, Calif.
COPELAND, RICHARD M., D.V.M., c/o General Delivery, Cross Plains, Wis.
DIXSON, JAMES L., D.V.M., 144 Market St., Cortez, Colo.
DONNELLY, CHARLES E., D.V.M., Plain, Wis.
ECHEVERRIA, DOM, D.V.M., Remuda Ranch, Wickenburg, Ariz.
FARROW, WILLIAM F., JR., D.V.M., c/o Dr. Richard Woods, Center, Colo.
FOSTER, CARL M., D.V.M., 1814 W. Reeve St., Compton, Calif.
GREEN, MILTON L., D.V.M., R. R. #2, Bayard, Neb.
HAMMERQUIST, HAROLD E., D.V.M., Box 485, Filer, Idaho.
HANSEN, HARRY E., D.V.M., 622 S. Washington St., Dillon, Mont.
HAYES, ALAN B., D.V.M., 400 F Street, Salida, Colo.
HAYES, DONALD M., D.V.M., Rt. 2, Box 270, Ft. Collins, Colo.
HUGHES, RAY E., D.V.M., 522 So. Whitcomb St., Ft. Collins, Colo.
JAMESON, EARL R., JR., D.V.M., 440 Walnut St., Apt. 4, Idaho Falls, Idaho.
JONES, ROBERT G., D.V.M., Richland Center, Wis.
KEYSER, RAYMOND C., D.V.M., Address unknown.
KROG, HAROLD G., D.V.M., Woonsocket, S. Dak.
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STRYFFELER, RUSSELL F., D.V.M., R.F.D. 2, Salem, Ohio.
TAYLER, CHARLES R., D.V.M., 420 So. Stratton St., Sullivan, Ind.
TAYLOR, ELMER R., D.V.M., Sugar Grove, Ohio.
TAYLOR, JAMES C., D.V.M., 641 Caddo, Corpus Christi, Texas.
TOTH, JOHN R., D.V.M., R.D. 2, Pearl Rd., Lorain, Ohio.
WEBER, WILLIAM J., D.V.M., P. O. Box 405, Ocala, Fla.
WEIDNER, RICHARD D., D.V.M., Baltimore, Ohio.
WILKIN, HAROLD E., D.V.M., 12720 Wayzata Blvd., Minneapolis, Minn.
WINE, JACK R., D.V.M., Rt. 1, Frazeysburg, Ohio.

University of Pennsylvania

BASQUE, JAMES F., V.M.D., Rt. 7, Pittsford, Vt.
BLEICHER, DANIEL D., V.M.D., 5869 Kemble Ave., Philadelphia, Pa.
BRUBAKER, MARQUIS N., V.M.D., Rt. 1, Box 528, McKeesport, Pa.
EPPERLY, HOWELL C., V.M.D., Hillsville, Va.
HOLLISTER, AMOS P., V.M.D., 97 Lake Ave., Montrose, Pa.
HUSTED, PAUL W., V.M.D., 180 Longwood Ave., Boston, Mass.
LOY, EDGAR L., V.M.D., R.D. #2, Newville, Pa.
MASON, JOHN O., V.M.D., 38 So., 51st St., Philadelphia, Pa.
OLIVIER, ALFRED G., V.M.D., 3438 Filbert St., Philadelphia, Pa.
SINGER, ALBERT, V.M.D., 1680 Teaneck Rd., Teaneck, N. J.
THOMPSON, JAMES F., JR., V.M.D., Rt. 23, Rd. #1, Spring City, Pa.
WOLF, SIDNEY L., V.M.D., 251 So. 52nd St., Philadelphia, Pa.

Texas A. and M. College

ALLISON, JAMES E., D.V.M., Box 630, Independence, Kan.
DANIELS, ROGERS C., D.V.M., 601 Park Place, College Station, Texas.
DAVIS, KENT J., D.V.M., Cross Plains, Texas.
FIELDS, FRED R., D.V.M., 9505 35th N. E. Avenue, Seattle, Wash.
FITTE, DWAYNE L., D.V.M., 616 Potomac St., Marlin, Texas.
FORTHMAN, CLARENCE H., D.V.M., 329 Angelo Dr., Corpus Christi, Texas.
HARDING, THOMAS E., D.V.M., Sidney, Mont.
HOLCOMB, HAROLD B., D.V.M., 6522 Lakeshore Drive, Dallas, Texas.
HUBERT, RODNEY L., JR., D.V.M., Jackson Animal Hospital, Meadowbrook Rd., Jackson, Miss.
JACKSON, HAROLD E., JR., D.V.M., 923 E. Elm St., Hillsboro, Texas.
KRAMER, PAUL H., D.V.M., 113 W. Church St., Weatherford, Texas.

MATHIS, JAMES M., D.V.M., So. Tyler Animal Hospital, Tyler, Texas.
MOORE, GUY T., D.V.M., P. O. Box 7, Riverdale, Md.
NAUERT, RICHARD F., D.V.M., Bartlett, Texas.
PATE, DONALD D., D.V.M., Box 418, College Station, Texas.
PONDER, WILLIAM H., D.V.M., 1007 W. Missouri St., Midland, Texas.
SCHMIDT, HENRY W., JR., D.V.M., Box 11, Taft, Texas.

Tuskegee Institute

WEATHERSBY, MILTON V., D.V.M., P. O. Box 192, D'Lo, Miss.

Washington State College

ANDERSON, DELL B., D.V.M., 15A S. Fairway, Pullman, Wash.
BAKER, GIRARD CLIFFORD, D.V.M., Goldendale, Wash.
COLENBAUGH, CLINTON W., D.V.M., Box 125, New Plymouth, Idaho.
COOPER, EARL LEO, D.V.M., Asotin, Wash.
CROSSLEY, ROBERT, D.V.M., c/o Metcalf Veterinary Clinic, Missoula, Mont.
FERDINANDSEN, JOHN WARREN, D.V.M., Box 815, La Grande, Ore.
GALE, NATHAN B., JR., D.V.M., 814 Spring St., Pullman, Wash.
GARDNER, ARNOLD HOWARD, D.V.M., 2360 Fairgrounds Rd., Salem, Ore.
GEORGE, LYNN A., JR., D.V.M., 402 Ave. B., Snohomish, Wash.
GITZEN, BILL, JR., D.V.M., 129 N. Grape St., Medford, Ore.
GUPTILL, CARTER C., D.V.M., 1102 E. Main St., Puyallup, Wash.
HOLTE, RALPH J. A., D.V.M., 503 Skyline Drive, Pullman, Wash.
KETTEL, ERNEST W., D.V.M., Deer Park, Wash.
KLIMKE, E. R., D.V.M., Rt. 1, Box 177, Enumclaw, Wash.
LARSON, ROY EMIL, D.V.M., General Delivery, St. Maries, Idaho.
McKNIGHT, ROBERT CECIL, JR., D.V.M., 624 Birch St., Dallas, Ore.
MARBLE, DEAN R., D.V.M., c/o Mrs. Roger Simon, Rt. 2, Wenatchee, Wash.
MARTIN, DONALD BRENT, D.V.M., 3752 Stevens Creek Rd., San Jose, Calif.
MAXWELL, WILLIAM, D.V.M., 2430 Meridian St., Bellingham, Wash.
METCALF, JOHN W., D.V.M., c/o Dr. P. A. Powers, Box 391, Gresham, Ore.
NILSON, MAJOR AMOS, D.V.M., 111 S. 2nd West, Smithfield, Utah.
PELLEY, THOMAS ROGER, D.V.M., Redmond, Wash.
PICKRELL, JAMES W., D.V.M., P. O. Box 248, Tucson, Ariz.
POLANSKY, LOUIS, D.V.M., 6 Washington St., Canton, Mass.
REED, CHARLES MOORE, D.V.M., 7313 Fauntleroy Ave., Seattle 6, Wash.
REID, RICHARD D., D.V.M., 933 W. Queen Ave., Albany, Ore.
ROYAL, FENTON N., D.V.M., 7727 S.E. 45th Ave., Portland, Ore.
RUSSELL, HAROLD WILLIAM, D.V.M., 1555 N. Church, Salem, Ore.
RYNCARZ, JAMES A., D.V.M., 10008 S. Pacific Ave., Tacoma, Wash.
SMITH, RALPH NICHOL, JR., D.V.M., 9088 Santa Monica Blvd., Los Angeles, Calif.
SNOOK, MERRILL DEAN, D.V.M., Deer Park, Wash.
ULRICH, CLARENCE G., D.V.M., Grand Chain, Ill.
VAN EECKHOUT, PAUL JOHN, D.V.M., Burlington, Wash.
VAUGHN, HARRY WILLIAM, D.V.M., Box 15, Potlatch, Idaho.
VENEMA, GEORGE J., D.V.M., 1079 5th St., Kirkland, Wash.
WOOD, LEONARD E., D.V.M., 2315 Williams Hwy., Grants Pass, Ore.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. Bureau of Animal Industry are reported as of July 17, 1953.

NEW APPOINTMENTS

Alonzo A. Anderson, Helena, Mont.
Robert P. Armstrong, Columbus, Ohio.
Ralph D. Barner, Kansas City, Kan.
Charles E. Bea, Sioux Falls, S. Dak.
Fred W. Cardwell, Memphis, Tenn.
Deron Collins, Jacksonville, Fla.
Robert D. Conrad, Olympia, Wash.
Morley H. Cook, South St. Joseph, Mo.
Frank T. Custer, Jr., Columbus, Ohio.
Clarence H. Forthman, Cheyenne, Wyo.
Lewis A. Goldfinger, New York, N. Y.
George W. Harlan, Kansas City, Kan.
John E. Howard, Los Angeles, Calif.
Arvel D. Matthewson, Jefferson City, Mo.
Walter R. Merryman, South St. Paul, Minn.
Paul L. Nelson, St. Paul, Minn.
Louis Polansky, Boston, Mass.
Winthrop C. Ray, Montpelier, Vt.
Robert Rubin, Beltsville, Md.
William C. Smart, Reno, Nev.
Howard M. Sweeny, Montpelier, Vt.
Sidney L. Wolf, Philadelphia, Pa.
James H. Wommack, Olympia, Wash.

CANCELLATIONS

Ralph D. Barner, Kansas City, Kan.
Robert D. Conrad, Olympia, Wash.
Dirk Hessing, Omaha, Neb.
Paul L. Nelson, St. Paul, Minn.

DEATHS

Lester E. Patton, Albuquerque, N.M.
Lloyd S. Robertson, Oklahoma City, Okla.

MILITARY FURLOUGH

Marion E. Hutto, Fort Worth, Texas.

RESIGNATIONS

Mrs. Norma S. Baluyut, Cincinnati, Ohio.
Allan J. Boddy, Portland, Ore.
Theodore Brand, Frankfort, Ky.

Walter Heinen, Mexico City, Mex.
Karl Katz, Albany, N. Y.
John C. Milliken, Denver, Colo.
Peter J. Ostapchuk, St. Paul, Minn.
Horton E. Ryan, Albuquerque, N.M.
Milton J. Tillery, Raleigh, N. Car.
Percy L. Walker, Chicago, Ill.

RETIREMENTS

Emmet S. Bacon, Los Angeles, Calif.
Harry A. Gamrath, Madison, Wis.
Charles L. Gegax, Mishawaka, Ind.
John F. Gest, Cincinnati, Ohio.

TERMINATIONS

Raymond A. Cook, Madison, Wis.
Albert L. H. Geffert, Madison, Wis.
Richard H. Hull, Madison, Wis.
Rudolph O. Omdalen, Madison, Wis.

TRANSFERS

Wiley W. Bird, from National Stockyards, Ill., to Sioux City, Iowa.

Marion L. Cravens, from Sioux City, Iowa, to Mishawaka, Ind.

Wesley A. Decker, from Denver, Colo., to Pueblo, Colo.

Earl F. Huffman, from Lansing, Mich., to Cheyenne, Wyo.

Willis H. Irvin, from Omaha, Neb., to Chicago, Ill.

Walter D. Jensen, from Jackson, Miss., to Sioux City, Iowa.

John L. Myers, from Ottumwa, Iowa, to Omaha, Neb.

John D. Puppel, from Sioux City, Iowa, to Cincinnati, Ohio.

John B. Simpson, from Mexico City, Mex., to Jefferson City, Mo.

Harry S. Smith, from Harrisburg, Pa., to Baltimore, Md.

William J. Smith, from Fort Dodge, Iowa, to Indianapolis, Ind.

Alfonsas Stankaitis, from Buffalo, N. Y., to Rochester, N. Y.

Benners B. Vial, Jr., from Louisville, Ky., to Memphis, Tenn.

Joan L. Wilbur, Jr., from St. Paul, Minn., to Helena, Mont.

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Dr. Duckworth Special Representative to Mexico.—Dr. Charles U. Duckworth has been appointed special assistant to the Secretary of Agriculture to serve in the cooperative efforts with Mexico for the eradication of foot-and-mouth disease in that country. Dr. Duckworth will assist in formulating a program that will lead to an early eradication of the disease.

In accepting the appointment, Dr. Duckworth, a native of Sacramento, Calif., interrupted an important assignment with the Mutual Security Agency in Europe. For the past year and a half, he has been assisting various countries of Europe and the Near East in combating foot-and-mouth disease. For many years previously, he had served as assistant director of agriculture in California.

AMONG THE STATES AND PROVINCES

California

New Appointments.—As of July 1, 1953, the California Department of Agriculture has appointed Dr. Arthur G. Boyd as assistant to the director of the State Department of Agriculture; Dr. James E. Stuart as chief, Division of Animal Industry; and Dr. Harry P. Bonnikson as chief, Bureau of Livestock Disease Control.

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Pathology Laboratory Holds Open House.—An open house was held June 17 at Petaluma, Calif., at the new $250,000 state livestock and poultry pathology laboratory. Dr. William H. Armstrong (OSU '37) is in charge of the new laboratory. It includes a large animal autopsy room, two poultry autopsy rooms, and many other facilities. The work at the laboratory will be confined to livestock and poultry diseases.

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Monterey Bay Association.—The 1953 officers of the Monterey Bay Area Veterinary Medical Association are: Drs. E. J. Mahler, Salinas, president; George Freiermuth, Hollister, vice-president; J. W. Harrison, Santa Cruz, second vice-president; Lewis J. Campbell, Salinas, secretary-treasurer; and C. S. Brooks, Hollister, program chairman. The regular meetings are held on the third Wednesday of each month.

s/LEWIS J. CAMPBELL, *Secretary.*

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Wild Burros Hunted.—Dr. W. A. Young, western regional director of the American Humane Association, recently made a trip to the Homewood Canyon district, Mojave Desert, to confirm a report that wild burros are being hunted for sport. The victims are descendants of burros which played such an important part in the early settlement of California. Unfortunately, there was much evidence of wanton shooting.—*Nat. Humane Rev., May, 1953.*

Connecticut

Dr. Plastridge Honored.—Dr. Wayne N. Plastridge, professor of animal diseases at the University of Connecticut, was given an award in April for his outstanding research contribution to the livestock industry of the northeast. Dr. Plastridge was specially honored for his research on vibrosis.

District of Columbia

District Association.—The District of Columbia Veterinary Medical Association held their third quarterly meeting at the Walter Reed Army Medical Center on June 16, with President E. Barnwell Smith presiding.

Dr. D. K. Detweiler, associate professor of pharmacology, School of Veterinary Medicine, University of Pennsylvania, spoke on "Heart Sounds, Murmurs, and Cardiac Arrythmias Encountered Clinically in the Dog."

s/WILLIAM C. PATTERSON, *Secretary.*

Georgia

State Association.—More than 100 veterinarians attended the forty-seventh annual meeting of the Georgia Veterinary Medical Association in the Biltmore Hotel, Atlanta, on June 22-23, 1953, with Dr. John T. Riddle of Marietta presiding.

The following veterinarians from South America attended the meeting: Drs. Carlos E. Chavez, Facultad de Medicina Veterinaria, Las Palmas, Burranco, Peru; Jorge Olivares Cabrera, Instituto de Biologia Animal, Lima, Peru; and Benjamin Moran, chief of the Division of Brucellosis, Buenos Aires, Argentina.

The following speakers from out of state highlighted the program: **Drs. H. C. Stephenson,** consultant, Cornell Virus Research Institute; **W. A. Aitken,** Chicago, editor in chief, AVMA publications; **W. G. Magrane,** Mishawaka, Ind.; **J. H. Edwards,** Memphis, Tenn.; and **G. J. Cottier,** Research Laboratory, Auburn, Ala.

Other speakers included **Drs. Robert Lawrence,** Decatur; **Chas. C. Rife,** Atlanta; **W. D. Martin, Jr.,** Albany; **W. A. Irvin,** Roswell; **A. M. Mills,** Athens; **J. L. Hopping, Sr.,** Atlanta; **Charles Williams,** Rome; **C. J. Mikel,** Atlanta; and **J. C. Pittman,** Jessup.

A commendable innovation was an 8:30 breakfast session at which questions were discussed. Instead of an evening banquet, a formal luncheon was enjoyed at noon on Monday.

As the Georgia Association has two meetings a year, the only business transacted at the June meeting was the election of officers: Dr. J. Roland Clanton, Thomasville, was elected president; Dr. Chas. Williams, Rome, president-elect; and Dr. Chas. C. Rife, Atlanta, secretary-treasurer.

s/CHAS. C. RIFE, *Secretary.*

Indiana

Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met in Oxford Park, Oxford, on June 25. During the early evening, members enjoyed golf and horseshoe pitching. After a picnic dinner, a short business meeting was held and **Dr. E. W. Spieth** of Jeffersonville gave a short talk on activities of the state Association.

s/J. L. KIXMILLER, *Resident Secretary.*

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Tenth District Association.—**Dr. Charles York,** Pitman-Moore Co., Indianapolis, discussed leptospirosis in cattle and other animals at the May 22 meeting of the Tenth District (Ind.) Veterinary Medical Association in Muncie.

The women were entertained by an action picture of a trip through Europe. Dr. and Mrs. H. Meade Hamilton, Muncie, were hosts.

s/J. L. KIXMILLER, *Resident Secretary.*

Kansas

Western District.—On May 17, the Western District of the Kansas Veterinary Medical Association met at the Elks Club in Dodge City.

Dr. Marvin J. Twiehaus, pathologist, Kansas State College, spoke and showed films on anthrax, rabies, atrophic rhinitis, and vesicular exanthema.

During the afternoon, while the above program was being enjoyed by about 20 veterinarians, the women gathered for bridge at the Ernest Hotel. The meeting concluded with a banquet at the Elks Club.

The next meeting will be a picnic at Scott County State Park, Scott City, in September.

s/K. M. CURTS, *Resident Secretary.*

Minnesota

Stallion Law Repealed.—The 46-year-old law which required the physical examination and registration of stallions and jacks in Minnesota, was recently repealed by the state legislature. The law had apparently outlived its usefulness. Only 156 stallions and 1 jack were registered in 1952, compared to 4,445 stallions in 1912. In recent years, the license fees received failed to cover the operating costs of the registration board, even though its secretary served without salary. Dr. W. L. Boyd, president of the AVMA, had long been a member of this board.

Missouri

Brucellosis Committee Appointed.—Recently, the Hon. L. C. Carpenter, Missouri commissioner of agriculture, appointed a 13-man state brucellosis committee, representing all livestock interests, as a consultative body to Dr. L. A. Rosner, Jefferson City, state veterinarian. Veterinary members of the committee are Drs. A. H. Quin, Kansas City; A. H. Groth, Columbia; and E. G. Bailey, Sr., Dexter. Mr. R. D. Pennewell, Palmyra, of the Guernsey Breeders' Association, is chairman.

s/A. H. QUIN.

New York

New York City Association Has New Headquarters Home.—The Veterinary Medical Association of New York City has announced a new "permanent home" and address. Henceforth, its headquarters will be the New York Academy of Sciences, 2, 4, and 6 East 63rd St., New York City. The Manhattan telephone directory will list the Association number in the Academy so that anyone will be able to contact the officers at any time.

For many years, the address of the Association has been Pearl River; the move will make it a truly New York City organization.

s/C. R. SCHROEDER, *Secretary.*

North Carolina

Officers of State Association.—The new officers of the North Carolina State Veterinary Medical Association are Drs. W. O. Slappey, Fayetteville, president; W. D. Collins, Winston Salem, president-elect; B. W. Dawsey, Gastonia, vice-president; D. R. Donahue, Morganton, member of executive committee; and C. W. Young, secretary-treasurer and resident secretary of the AVMA.

s/CLYDE W. YOUNG, *Secretary.*

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Dr. Boyd to Help Set Up Research Program.—Dr. W. L. Boyd, director emeritus of the College of Veterinary Medicine, University of Minnesota, has arranged to spend six months or more at the North Carolina State College, in Raleigh, where he will assist in setting up a program of animal disease research diagnosis and education.

Ohio

Northwestern Association.—On March 18, 1953, the Northwestern Ohio Veterinary Medical Association met at the Hillcrest Hotel in Toledo, with approximately 100 in attendance.

The following speakers comprised the program: **Drs. L. E. Johnson,** Ohio State University, Columbus; **O. Norling-Christensen,** Wilmette, Ill.; **C. W. Cromley,** Ashville; **Harry Hosafrus,** Carey; **N. D. Backus,** Elyria; **Chas. A. Fast,** Van Wert; **C. W. Witty,** Elmore.

The Association officers for 1953 are: Drs. C. W. Witty, Elmore, president; M. I. Custer, Toledo, vice-president; and C. S. Alvanos, Toledo, secretary-treasurer.

s/C. S. ALVANOS, *Secretary.*

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Southern Association.—The Southern Ohio Veterinary Medical Association met on April 2 at the General Denver Hotel in Wilmington with 45 in attendance. The guest speaker, **Dr. Nathan Hale** (M.D.), discussed cancer.

The following officers were elected at this meeting: Drs. Harry Cornett, Lebanon, president; Robert J. Custis, New Vienna, vice-president; and Lowell Walker, Lynchburg, secretary-treasurer.

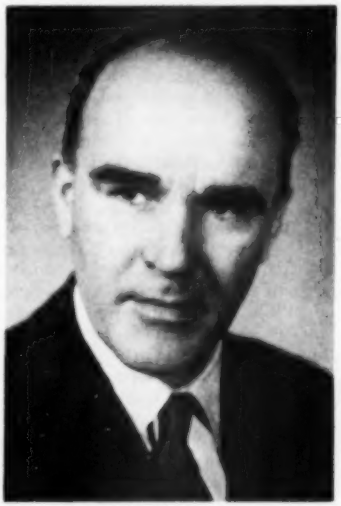
s/R. J. CUSTIS, *Retiring Secretary.*

Oklahoma

Hospitals for Large Animal Practice.—Under the heading of "Hospitals—A Herd Necessity," the *Aberdeen Angus Journal* (June, 1953) published four pages of pictures and discussion regarding the advantages of a veterinary hospital for large animals. It features the hospital of Drs. Ratliff, Wells, and Swartz at Tulsa.

Ontario

Dr. Ballantyne Appointed Head of Department of Anatomy.—Appointment of Dr. John H. Ballantyne (ONT '39) as head of the Department of Anatomy at the Ontario Veterinary College was announced recently by Dr. T. Lloyd Jones, principal of the College. After receiving his D.V.M. degree, Dr. Ballantyne practiced for six months then joined the federal



Dr. John H. Ballantyne

government as food and meat inspector. During World War II, he served with the R.C.N.-V.R. in Newfoundland. He joined the college staff in 1945 as an instructor in the anatomy department. Dr. Ballantyne succeeds the late Dr. V. R. Brown in his new appointment.

Pennsylvania

Pennsylvania Veterinary Examining Board Adopts New Regulations.—The Pennsylvania State Board of Veterinary Medical examiners has, under the broad statutory powers granted them, adopted the following regulations effective on the dates shown:

> An applicant for licensure to practice veterinary medicine shall not be admitted to an examination for licensure unless he submits evidence of having been employed for at least ten (10) weeks by a duly licensed veterinarian actively engaged in the practice of veterinary medicine. Effective 1/1/55.
>
> A student enrolled in an approved school of veterinary medicine who has satisfactorily completed the third year of the required course may be employed as an assistant in the Bureau of Animal Industry of the State Department of Agriculture during the summer vacation. Effective 4/7/53.

The paragraph in the law which was interpreted to give the Board this authority is the following:

To establish and alter from time to time, the standards of preliminary and professional education, and the training required for licensure to practice veterinary medicine.

s/R. D. HOFFMAN.

Texas

Officers of Bexar County Association.—The following officers were installed during a regular monthly meeting of the Veterinary Medical Association of Bexar County held June 16, 1953, in Damon's Cafe, San Antonio: Dr. Gerald W. Parker, San Antonio, president; Colonel Harvie R. Ellis, Fort Sam Houston, vice-president; Roscoe O. Sealy, San Antonio, secretary; and E. L. Soyars, San Antonio, treasurer.

s/ROSCOE O. SEALY, *Secretary.*

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Death of Colonel Worthington.—Colonel Josiah W. Worthington, who had recently retired from the Veterinary Corps, U. S. Army, was shot and fatally wounded by a neighbor on June 17, 1953. Apparently the tragedy arose when the neighbor became enraged over the crying of a child at a prenuptial celebration being held for Colonel Worthington's daughter.

Colonel Worthington, a veteran of both world wars, served memorably with General Wainwright's forces on Bataan during the second world war. After the fall of Bataan, he became a Japanese prisoner of war and was liberated in 1945.

Interment, with full military honors, was in the national cemetery at Fort Sam Houston. An obituary appears on p. 270 of this JOURNAL.

Vermont

Veterinary Conference.—The Vermont Veterinary Medical Association and the University of Vermont and State Agricultural College presented the sixth annual conference for veterinarians on June 19-20, 1953, at the Prospect House, Lake Bomoseen. There were 76 veterinarians and their guests in attendance at the conference.

The following speakers participated in the program: **Drs. James Archibald** and **C. A. V. Barker,** Ontario Veterinary College, Guelph; **Carl Boyd,** assistant inspector in charge, BAI, Boston, Mass.; **Norman Cox,** practitioner and president, Vermont Veterinary Medical Association, Rutland; **W. B. Durrell,** University of Vermont, Burlington; **H. L. Easterbrooks,** University of Connecticut, Storrs; **C. E. Hults,** West Rutland; **E. M. Powers,** Bradford; **J. F. Roberts, Jr.,** Woodstock; **Cornelius Thibeault,** Wakefield, Mass.; and **Mr. Alan R. Foley,** Dartmouth College, Hannover, N. H.

s/W. B. DURRELL, *Resident Secretary.*

Wisconsin

Burr A. Beach Award Established.—The Wisconsin Veterinary Medical Association established an annual award this year, known as the Burr A Beach Award, in recognition of superior scholarship and promise in research by those in graduate training and research at the University of Wisconsin. The award is $100 in cash. The Wisconsin Veterinary Medical Association established this award in honor of Dr. Beach's many years of outstanding and sincere efforts to the veterinary profession and as secretary of the Association.

s/CARL A. BRANDLY.

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Dr. Scott Honored.—On June 19, 1953, the University of Wisconsin presented the Burr A. Beach Award of the Wisconsin Veterinary Medical Association to Dr. Gordon Ramsey Scott in recognition of his excellent and superior accomplishments in graduate scholarship and for his original and productive research which will advance the art and the science of veterinary medicine.

Dr. Scott is a graduate of the Royal Veterinary College, Edinburgh, Scotland, and is presently a member of the staff of the Kenya, East Africa, veterinary laboratory. He has been at Wisconsin doing research and graduate work since July 1, 1952, and received his M. S. degree in veterinary science at this year's commencement. He plans to return to Kenya about July 1 with the expectation of returning to Wisconsin to complete his Ph.D. work.

s/CARL A. BRANDLY.

Wyoming

Dr. Good Elected President of State Board of Health.—Dr. G. H. Good, state veterinarian of Wyoming, has been elected president of the Wyoming State Board of Health. This recognition of the importance of the veterinary profession in human health also compliments Dr. Good's ability in past service on the Board.

s/J. F. RYFF.

FOREIGN NEWS

Colombia

New Equine Malady.—Dr. J. A. Villamil of Bogota, Columbia, reports that a peculiar malady in horses is causing considerable concern in that country. It consists of an ulceration of the bony alveoli which perforates the entire dental bone structure. Its cause is not known nor have therapeutic agents been effective. He also states that canine hepatitis infecciosa is currently appearing.

Japan

New Virus Diseases of Goats.—Since January, 1948, outbreaks of contagious pneumonia among goats of the government breeding stock stations have resulted in numerous casualties.

A Pasteurella was thought to be the causative organism, but a new agent resembling psittacosis granuloma pneumonitis virus was isolated in 1952. This virus can be transmitted to the horse, cow, sheep, rabbit, guinea pig, mouse, chicken, and pig, to which it is particularly pathogenic. Though the mortality is not high when no other complication exists, the growth of the diseased animal is remarkably affected and hindered.

s/KOGI SAITO, *Foreign Corresponding Secretary.*

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Council on Veterinary License.—On March 26, 1953, the Council on Veterinary License announced the successful candidates of the fourth national examination for veterinary license. Of 509 candidates, 404 (80%) were successful. This is approximately the same percentage as in 1952. Two foreign veterinarians passed the examination, one a U. S. Army veterinarian from the University of Pennsylvania and the other a Norwegian from Leipzig University.

s/KOGI SAITO, *Foreign Corresponding Secretary.*

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National Association.—The general meeting of the Japan Veterinary Medical Association was held in Tokyo on March 24, 1953. The following officers were elected: Drs. Y. Ochi, professor at Tokyo University, president; S. Kondo and G. Ebara (reëlected) vice-presidents.

s/KOGI SAITO, *Foreign Corresponding Secretary.*

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Veterinarians Attend International Congress.—The following veterinarians attended the International Veterinary Congress in Stockholm: Drs. Y. Ochi; R. Muto, president of V.M.A. in Gifu Prefecture; K. Hirato, professor of the veterinary college of Hokkaido University; and Y. Tanaka, deputy chief of the Animal Hygiene Section, Agricultural Ministry.

s/KOGI SAITO, *Foreign Corresponding Secretary.*

Mexico

Zootechnic Activities in Mexico.—A fine livestock show was held in Mexico City, Nov. 16 to 23, 1952. It was the first to be held since eight years ago when these shows were suspended on account of aftosa (foot-and-mouth disease). Prize animals from all parts of the Republic were exhibited. Another livestock show was held in Monterrey, N.L., December 1 to 14.

In both expositions, animals were exhibited from the following breeds: Holland, Brown Swiss, Jersey, Guernsey, Ayrshire, Charole, Hereford, and Zebu cattle; Arabian, Anglo-Arabian, and English horses; Duroc Jersey hogs; Hampshire, Rambouillet, Suffolk, and Karakul sheep; and poultry of many different breeds.

Dog Show in Monterrey, N.L., Mexico
A trophy was given to one of the winning dogs. Standing (left to right)—Drs. Gonzalo Aquilera, secretary of the dog show committee; Dr. José del Pozo-Organizer, head of the esposition; and Dr. Alfonzo Alexander, judge of the dog show.

At Monterrey, there was also a dog show which was an important feature. All the judges were Mexican zoötechnic veterinarians.

In Mexico, it has always been deemed wise that the breeding and production of domestic animals be under the guidance of zoötechnic veterinary doctors since that profession possesses the best knowledge of genetics and zoötechnics.

Since 1945, the degree of doctor of veterinary zoötechnics has been granted by Escuela Nacional de Medicina Veterinaria y Zootecnia (National School of Veterinary Medicine and Zootechnics). The judges of the livestock shows have always been members of our profession.

s/ALFONSO ALEXANDER,
Foreign Corresponding Secretary.

• • •

New School of Veterinary Medicine and Zootechnics.—This year the new School of Veterinary Medicine and Zootechnics in Mexico City will be finished. Its cost will be around $3 million; its installation, equipment, and furniture have been calculated at another $1 million.

This new school will have room for 500 students and will have ample space for clinics for small and large animals and modern laboratories.

In a separate unit, there will be a surgical ward with operating rooms for large and small animals. Each will have a glass-enclosed observatory so the students may witness the operations from the outside of the operating rooms. The teacher's voice will be transmitted by loud-speakers.

In a separate ward, one of the most modern laboratories will be installed for the treatment and control of virus diseases. A splendid library with all the modern improvements and comforts is provided.

A farm with stables and stalls for zoötechnic instruction of the students is 4 kilometers from the school.

s/ALFONSO ALEXANDER,
Foreign Corresponding Secretary.

Nigeria

Trypanosomiasis in West Africa.—Most domestic animals are susceptible to trypanosomiasis but several breeds of cattle native to Africa are immune and some local breeds of sheep and goats are quite resistant. However, the latter are not present in sufficient numbers in Nigeria, so susceptible animals must be trekked hundreds of miles from other areas to provide food and the resulting losses from trypanosomiasis are often heavy. Several prophylactic drugs have been used experimentally and two have proved of value. Antrycide gave almost complete protection and dimidium chloride gave a high degree of protection.

In a recent experiment, one of two herds of Zebu cattle which were to be trekked 400 miles were compared. One group was injected with a prophylactic dose of antrycide, the other group was used as a control. On arrival at their destination, the control group had suffered

The new School of Veterinary Medicine and Zootechnics, Mexico City, which will be completed this year.

100 per cent infection and 20 per cent losses, while in the treated group only 5 per cent were infected with a loss of 5 per cent.

The tsetse fly which is a carrier of the infection lives in bushes along rivers and other watering places. Removal of these bushes to protect man against trypanosomiasis is practical but this project would be too large and too costly for the protection of livestock. Spraying insecticides from aircraft is also ineffective because of the fly's habit of resting on the underside of leaves. The disease can be controlled with drugs but attempts to breed resistant animals will continue.

S/DESMOND H. HILL, *Foreign Corresponding Secretary.*

VETERINARY MILITARY SERVICE

Army Veterinarians Change Posts.—Colonel Russell McNellis, V.C., left his post as chief of the Meat and Dairy Hygiene Branch, Veterinary Division, Office of the Army Surgeon General, on June 12 to take an assignment at Headquarters, Sixth Army, the Presidio, San Francisco. He was succeeded in the Meat and Dairy Hygiene Branch by Col. Curtis W. Betzold, V.C., First Army veterinarian, Governors Island, N. Y.

• • •

Air Force Represented at Public Health Conference.—Major Frederick W. Clayton, V.C., U.S.A.F., represented the Air Force at the second meeting on animal disease and veterinary public health problems at the Communicable Disease Center, Atlanta, Ga., June 15-19, 1953. Animal disease problems and their effect on public health were discussed.

• • •

Colonel Stevenson Assigned to San Francisco Port of Embarkation.—Colonel Daniel S. Stevenson, former chief of the Third Army Veterinary Corps and veteran of service in Africa, Italy, France, Germany, and Panama, has been assigned to duty with the San Francisco Port of Embarkation, Fort Mason, Calif. Colonel Stevenson holds the Legion of Merit and the French Croix de Guerre among his decorations and awards. During his four and one-half years of service as chief of the U. S. Military Mission, Republic of Panama, he established a bureau of animal industry, animal quarantine station, and an educational system for Panamanian veterinarians.

• • •

Air Force Veterinarians Graduated from Advanced Course.—Seven Air Force veterinarians were graduated recently from the advanced medical course, Walter Reed Army Medical Center, Washington, D. C.

They are Col. Benjamin F. Leach, Lt. Col. John R. Nettles, Jr., Col. James C. McIntyre, Lt. Col. Norbert A. Lasher, Major Samuel F. Huber, Major John S. Bixby, and Major William M. Davidson.

The course emphasizes the relationship to military veterinary preventive medicine and public health, as well as a comprehensive coverage of the most recent advances in staff and administrative procedures.

BIRTHS

Dr. (COL '44) and Mrs. A. N. Sheppard, Elizabethtown, Ky., announce the birth of a daughter, Martha Louise, on May 23, 1953.

Dr. (UP '52) and Mrs. Lynn R. Derby, Binghamton, N. Y., announce the birth of their second daughter, Sheryl Lynn, on May 24, 1953.

Dr. (OSU '49) and Mrs. Franklin O. Gossett, Greenfield, Ind., announce the birth of a son, Kent Alan, on June 1, 1953.

Dr. (GA '51) and Mrs. L. Gene Yarboro, Shelby, N. Car., announce the birth of a son, Edward David, on June 16, 1953.

Dr. (MSC '47) and Mrs. Russell N. Abbott, Rockland, Maine, announce the birth of a son, Randall Keith, on June 22, 1953.

Dr. (MO '52) and Mrs. J. A. Zacher, Kansas City, Mo., announce the birth of a son, Brett Alan, on June 24, 1953.

Lieutenant (TEX '51) and Mrs. James R. Prine, Washington, D. C., announce the birth of their second son, David Jon, on July 10, 1953.

DEATHS

Harry G. Audinwood (MCK '20), Tioga, Pa., died recently. Audinwood was a general practitioner.

Edward F. Bettinger (ONT '95), Chittenango, N.Y., died recently. Dr. Bettinger, who had specialized in equine practice, had retired.

James C. Brown (OVC '15), 69, Willowdale, Ont., died June 23, 1951. Dr. Brown was a general practitioner.

Leon C. Davie (COR '07), Wellsville, N.Y., died recently. Dr. Davie was a general practitioner.

Frederick E. Davis (UP '10), Nanticoke, Pa., died July 17, 1953. Dr. Davis was one of the organizers of the Nanticoke Kiwanis Club, serving as its first vice-president and its second president. For the past twenty-eight years, he served as chairman of its committee for underprivileged children. He was also one of the organizers of the Peoples Bank of Nanticoke and served on its board of directors. Dr. Davis is survived by his widow and four children.

Randall J. Devereux (OVC '40), 35, Toronto, Ont., died in June, 1953. Dr. Devereux served in the Canadian army during World War II. He

was a member of the Ontario Veterinary Association and had been a member of the AVMA.

John D. Gogerty (AVC '96), 76, Mt. Vernon, N. Y., died May 6, 1953. Dr. Gogerty served as veterinarian to the New York State Racing Association.

★**Herbert R. Groome** (KSC '07), 70, Twin Falls, Idaho, died June 26, 1953. Dr. Groome had practiced for thirty-five years in Twin Falls. For two years, he served as state veterinarian of Idaho. He was admitted to the AVMA in 1919. Dr. Groome is survived by two daughters.

Alfred L. Holt (COR '35), 44, Brigham City, Utah, died March 10, 1953. Dr. Holt was a member of the Long Island Veterinary Medical Association and had been a member of the AVMA.

Floyd E. Hoyt (COR '18), 64, Central Square, N. Y., died recently. Dr. Hoyt was a member of the Central New York Veterinary Medical Association and had been a member of the AVMA.

Nelson R. Liner (COR '33), Rochester, N. Y., died recently. Dr. Liner was a practitioner.

Theo. S. List (CVC '13), 68, Huntington Park, Calif., died May 8, 1953. Dr. List worked as a meat inspector for the U. S. Bureau of Animal Industry.

Robert I. Lowenberg (STJ '15), 62, South St. Paul, Minn., died June 9, 1953. Dr. Lowenberg was employed by the U. S. Bureau of Animal Industry.

Robert A. McCartney (COR '18), Ellenville, N. Y., died April 9, 1953. Dr. McCartney was in general practice.

Hilton L. McRoberts (ISC '11), 68, Columbus Junction, Iowa, died July 5, 1953. Dr. McRoberts had practiced in Columbus Junction for more than forty years. He is survived by two daughters and four grandchildren.

★**Claude T. Old** (KCV '13), 63, Sikeston, Mo., died Dec. 16, 1952. Dr. Old was a general practitioner. He was a member of the Missouri State and Southeastern Veterinary Medical Associations and of the AVMA.

Eldon D. Patterson (STJ '10), St. Joseph, Mo., died April 5, 1953. Dr. Patterson was a general practitioner.

★**Lester E. Patton** (OSU '11), 64, Albuquerque, N. M., died June 16, 1953. Dr. Patton was a general practitioner. He was a member of the Montana and New Mexico Veterinary Medical Associations and was admitted to the AVMA in 1929.

★**James F. Robb** (ONT '32), 58, Santa Barbara, Calif., died Nov. 16, 1952. Dr. Robb retired from his practice in Jackson, Mich., in 1951 and entered the U. S. Department of Agriculture, Poultry and Meat Inspection Bureau. He was a member of the Michigan State Veterinary Medical Association and of the AVMA. Dr. Robb is survived by his widow.

Milton T. Perry (HAR '00), 74, Springfield, Mass., died April 27, 1953. Dr. Perry was a retired employee of the U. S. Bureau of Animal Industry.

★**Frederick W. Rutherford** (OVC '10), 80, Maysville, Ohio, died June 12, 1953. Dr. Rutherford, a general practitioner, was a member of the Missouri Veterinary Medical Association and of the AVMA.

James L. Shorey (ONT '99), Stephentown, N. Y., died recently. Dr. Shorey was a general practitioner.

Clarence E. Smith (KCV '07), 76, Kansas City, Kan., died March 4, 1953. Dr. Smith was one of the pioneers of the veterinary profession in food inspection. He is survived by his widow, two daughters and one son.

Arnold G. Tumin (ONT '17), 53, Syracuse, N. Y., died Jan. 1, 1953. Dr. Tumin was well known as a trainer of race horses.

Milton H. Williams (HAR '94), Sunderland, Mass., died April 24, 1953. Dr. Williams was elected to membership in the Massachusetts Veterinary Association in 1916 and had been an honorary life member since January 1951.

James W. Willis (API '41), 42, Sparta, N. Car., died May 6, 1953. Dr. Willis was employed by the North Carolina Department of Agriculture until the last two or three years when he engaged in practice at Sparta. He was a member of the North Carolina Veterinary Medical Association and had been a member of the AVMA.

Colonel Josiah W. Worthington (KSC '17), Brownsville, Texas, died June 17, 1953. Colonel Worthington entered military service at Fort Sam Houston in 1917, as a second lieutenant in the Veterinary Corps. During World War II, he was a member of General Wainwright's staff and was imprisoned with him after the fall of Bataan. For his initiative and foresight in providing supplies for the besieged forces on Bataan, he was awarded the Bronze Star.

Colonel Worthington is survived by his widow, Berniece Loomis Worthington, a daughter, and three sons.

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Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

Frank W. Fitzwater (ONT '11), Oakwood, Ohio.

Harlow H. McGrew (STJ '12), Drexel, Mo.

Louis Metsker (CVC '99), Tower Hill, Ill.

W. P. Newman (CVC '11), Brenham, Texas.

Leonard N. Ritter (API '40), Hattiesburg, Miss.

Jean Savoie (MON '42), Ville Marie, Que.

Elmer E. Seitz (NAT '96), Glen Rock, Pa.

Dalton C. Snow (ONT '07), Guysville, Ohio.

Loyd N. Wood (SF '07), Traver, Calif.

*Indicates members of the AVMA.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Northeast Mississippi Veterinary Medical Association Clinic. Dr. W. L. Stroup's Clinic, Corinth, Miss., Sept. 8, 1953. G. A. Knox, Tupelo, Miss., secretary.

Colorado Veterinary Medical Association. Annual meeting. Greeley, Colo., Sept. 10-11, 1953. Paul D. Pattridge, Rt. 1, Box 387-A, Golden, Colo., secretary.

Virginia State Veterinary Medical Association. Semiannual meeting. Cavalier Hotel, Virginia Beach, Va., Sept. 10-12, 1953. A. J. Sipos, 1102 State Office Building, Richmond 19, Va., secretary.

New Mexico Veterinary Medical Association. Annual meeting. Navajo Lodge, Ruidoso, N. M., Sept. 14-15, 1953. Joe M. Miller, Box 149, Alamogordo, N. M., secretary.

New York State Veterinary Medical Society. Annual meeting. Hotel Syracuse, Syracuse, N. Y., Sept. 14-16, 1953. J. S. Halat, 803 Varick St., Utica, N. Y., acting executive secretary.

Northern Illinois Veterinary Medical Association. Regular meeting. Hotel Faust, Rockford, Ill., Sept. 16, 1953. J. W. Boller, Harvard, Ill., secretary.

Louisiana Veterinary Medical Association. Fall meeting. Hotel Bentley, Alexandria, La., Sept. 16-17, 1953. R. B. Lank, Baton Rouge, La., secretary.

Alabama Annual Conference for Veterinarians. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala., Sept. 17-19, 1953. R. S. Sugg, dean.

U. S. Livestock Sanitary Association. Annual meeting. Haddon Hall, Atlantic City, N. J., Sept. 23-25, 1953. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

West Virginia Veterinary Medical Association. Fall meeting. Daniel Boone Hotel, Charleston, W. Va., Oct. 4-5, 1953. Elvin R. Coon, 98 Capitol Building, Charleston 5, W. Va., secretary.

Purdue University. Annual short course for veterinarians. Purdue University, Lafayette, Ind., Oct. 7-9, 1953. L. M. Hutchings, chairman.

Georgia Coastal Plain Experiment Station. Annual short course for veterinarians. Georgia Coastal Plain Experiment Station, Tifton, Ga., Oct. 12-13, 1953. Peter H. Langer, secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Roosevelt Hotel, Pittsburgh, Pa., Oct. 14-16, 1953. R. C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association. Annual Meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 15-16, 1953. Wayne W. Thompson, Earlville, Iowa, secretary.

Illinois, University of. Annual veterinary conference and short course for veterinarians. College of Veterinary Medicine, University of Illinois, Urbana, Ill., Oct. 15-17, 1953. L. E. Boley, chairman.

New England Veterinary Medical Association. Annual meeting. Hotel Viking, Newport, R. I., Oct. 18-20, 1953. C. Lawrence Blakely, 180 Longwood Ave., Boston 15, Mass., secretary.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 22-23, 1953. R. M. Scott, 2419 S. Main St., Sioux Falls, S. Dak., secretary.

Omega Tau Sigma Fraternity. Annual convention. University of Georgia, Athens, Ga., Oct. 24, 1953. E. D. Risher, Jr., Box 235, Ag Hill, Athens, Ga.

Interstate Veterinary Medical Association. Annual meeting. Martin Hotel, Sioux City, Iowa, Oct. 29-30, 1953. K. W. Smith, 510 W. 19th, Sioux City, Iowa, secretary.

Oregon State Veterinary Medical Association. Fall meeting, Portland, Ore., Oct. 31, 1953. E. L. Holden, Oswego, Ore., secretary.

Southern Veterinary Medical Association. Annual meeting. Atlanta Biltmore Hotel, Atlanta, Ga., Nov. 9-11, 1953. A. A. Husman, Raleigh, N. Car., secretary.

Animal Care Panel. Annual meeting. Billings Hospital, University of Chicago, Chicago, Ill., Dec. 2-3, 1953. The program will be ready for distribution in September and may be obtained by writing to Robert J. Flynn, Secretary, Animal Care Panel, Argonne National Laboratory, P. O. Box 299, Lemont, Ill.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 6-8, 1954. W. A. Hagan, dean.

Kansas State Veterinary Medical Association. Annual meeting. Broadview Hotel, Wichita, Kan., Jan. 18-20, 1954, K. Maynard Curts, Kansas City, Kan., secretary.

Texas Veterinary Medical Association. Annual meeting. Hotel Galvez, Galveston, Texas, Jan. 25-26, 1954. Alvin A. Price, College Station, Texas, executive secretary.

Minnesota State Veterinary Medical Society. Annual meeting. St. Paul Hotel, St. Paul, Minn., Jan. 25-27, 1954. B. S. Pomeroy, St. Paul, Minn., secretary.

Illinois State Veterinary Medical Association. Annual meeting. Morrison Hotel, Chicago, Ill., Feb. 9-12, 1954. A. G. Misener, 6448 N. Clark St., Chicago 26, Ill., secretary.

(Continued on p. 32)

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BRANCHES

Albany, Ga. — Louisville, Ky. — Memphis, Tenn. — Miami, Fla. — Raleigh, N.C.

(COMING MEETINGS—*continued from p. 30*)

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. David E. Madsen, 44 South 4th St., San Jose, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. W. E. Smith, 516 Oatman, Sanger, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Mr. Earl D. Adams, Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. J. R. Rosdail, Pomeroy, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association, the first Friday of the month at the York Hotel, Sixth and Market Streets. Luther E. Fredrickson, Room 11, Municipal Courts Bldg., St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas. the first Thursday of each month.

(*Continued on p. 34*)

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Protein Plus

Every tasty nugget of Ken-L-Biskit contains the extra protein of both meat meal and liver meal. Dogs love the meaty flavor that's locked right in . . . thrive on the complete nutrition. Feed it dry as a between-meal snack, or quick-mix with water. In 2, 4, 25, and 50 lb. sizes.

(COMING MEETINGS—*continued from p. 32*)

Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. E. M. Lang, 716 E. Broadway, Louisville, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. Richard A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

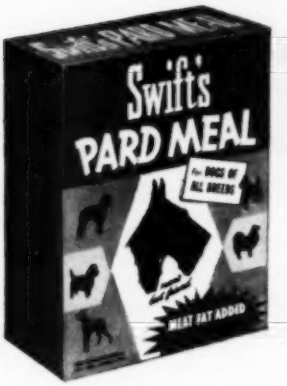
Michiana Veterinary Medical Association, the second Thursday of each month, at Hotel LaSalle, South Bend, Ind. Bruce Hostrawser, 2621 Mishawaka Ave., South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

(*Continued on p. 36*)

26th Anniversary
National Dog Week
September 20-26

It's his week!



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Swift's Pard Meal is the new dry-type dog food that actually has a FLAVOR DOGS CAN'T RESIST. It's been tested and tested and proven. It's the dog meal with an appetite appeal such as you didn't believe there'd ever be.

Swift's Pard Meal contains extra amounts of rich meat fat for super energy and fuller nutrition. It's a kernel-type food, and homogenized of course. It won't flake or powder, and won't turn rancid. It's a complete diet—a dog needs nothing more.

More and more dealers are carrying it. It's available in 25 and 50-lb. bags, and small cartons.

PARD is Swift's famous canned dog food. Here is the "pioneer" product of them all —for 20 years leading the way to today's high level of nutritional excellence in commercial dog foods. A dog needs nothing more—you can recommend nothing better than Pard.

(COMING MEETINGS—*continued from p. 34*)

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. C. Edward Taylor, 2146 S. Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 66 Marion Ave., Salinas, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark R3, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63 St., New York City. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. W. C. Schilb, 4312 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 7:00 p.m. in the Antlers Hotel, San Bernardino, Calif. R. E. Hoadley, Coachella, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. G. V. McCranie, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month,

(*Continued on p. 38*)

A POINT WORTH HONORING!

The point we wish to emphasize is that veterinarians, breeders, sportsmen and pet owners have made Homogenized* Gaines Meal America's largest-selling dog meal.

Appetite Appeal!

These people have obviously appreciated the keen enthusiasm their dogs show for Gaines at each daily feeding. Thanks to a unique Gaines process all ingredients of this Homogenized Meal are combined into crunchy little granules. These granules are so tempting in texture, aroma and taste, that many dogs enjoy eating the food dry. That makes Gaines Meal excellent for self-feeding methods.

More important, these dog owners are quick to realize that health factors depend greatly on the dog's diet. And it is widely known that Gaines Meal provides balanced amounts of every food essential dogs are known to need—providing the same complete nourishment in every package, every mouthful, every granule.

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**Uniform Nourishment Guaranteed. Developed by the Gaines Laboratories. Tested at the famous Gaines Research Kennels.*

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"Nourishes EVERY INCH of a Dog"

America's Largest-Selling Dog Meal

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in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H. M. Strandberg, 203 D St., Petaluma, Calif., secretary.

Roanoke-Tar (N. Car.) Veterinary Medical Association, the first Friday of each month, time and place specified monthly. C. B. Randall, Kinston, N. Car., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. F. Ferguson, 1702 S. Dort Highway, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. Warren J. Dedrick, 904 S. Lemon, El Cajon, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

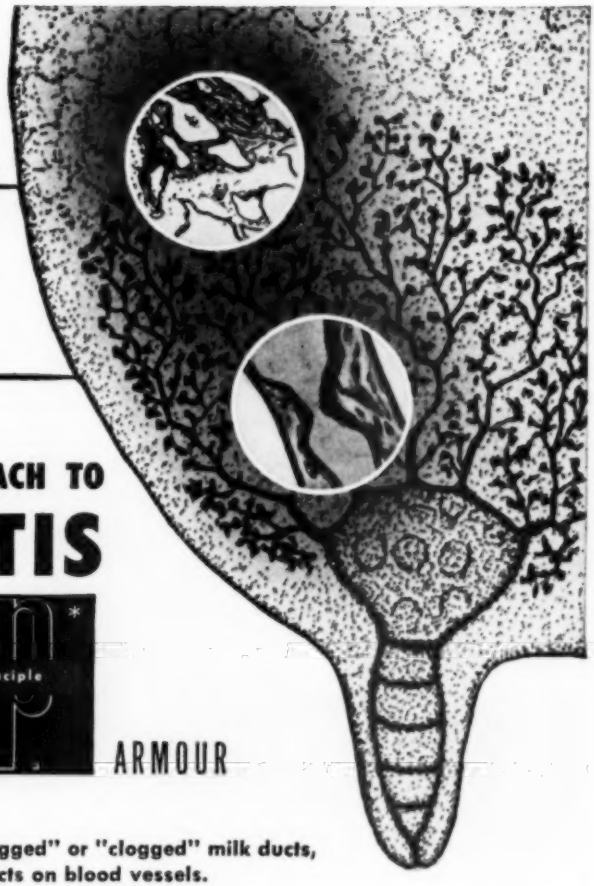
Southern California Veterinary Medical Association, the third Wednesday of each month. R. W. Sprowl, 11756 San Vicente Blvd., Los Angeles 49, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

Foreign Meetings

Second Pan American Congress of Veterinary Medicine. Sao Paulo, Brazil, April 3-10, 1954. Dr. Joao Soares Veiga, chairman; Dr. Virginia Buff D'Apice, secretary general, P.O. Box 7064, Sao Paulo, Brazil.



PHYSIOLOGIC APPROACH TO MASTITIS

P.O.P.* purified oxytocic principle

ARMOUR

ADVANTAGES

- Debridement of "plugged" or "clogged" milk ducts, without pressor effects on blood vessels.
- Flushing effect on the entire duct system.
- Reduces the dilution of therapeutic agents by eliminating residual milk and exudates.
- More efficient penetration of sulfonamides, antibiotics, or other agents to source of infection and throughout the infected quarter.
- Early reduction of temperature and edema.
- Early return of appetite and normal appearing milk
- Return of normal milk production in 24 hours, in many cases.
- Economical.

*Armour's trade name for veterinary purified oxytocic principle preparation. Double U.S.P. strength.

Sold to Graduate Veterinarians Only

VETERINARY LABORITORIES

Kansas City 18, Kansas

ARMOUR

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Remittance must accompany order.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Recent graduate wanted to work in small animal hospital in Washington, D.C. Experience not necessary. Good salary with percentages and eventual partnership for right person. Address "Box K 9," c/o JOURNAL of the AVMA.

Graduate veterinarian from recognized college wanted to assist in small animal hospital. Illinois license required. Excellent starting salary and rapid increases commensurate with ability and willingness to cooperate. Address D. S. Jaffrey and Son, 2534-36 W. Madison St., Chicago 12, Ill.

Assistant wanted for modern small animal hospital in Connecticut. Excellent opportunity for good man. Send qualifications and salary expected in first letter. Address "Box L 1," c/o JOURNAL of the AVMA.

Experienced graduate wanted for large animal practice. Must be capable; position has future possibilities for right man. Wonderful opportunity. Located near Chicago. Address "Box L 11," c/o JOURNAL of the AVMA.

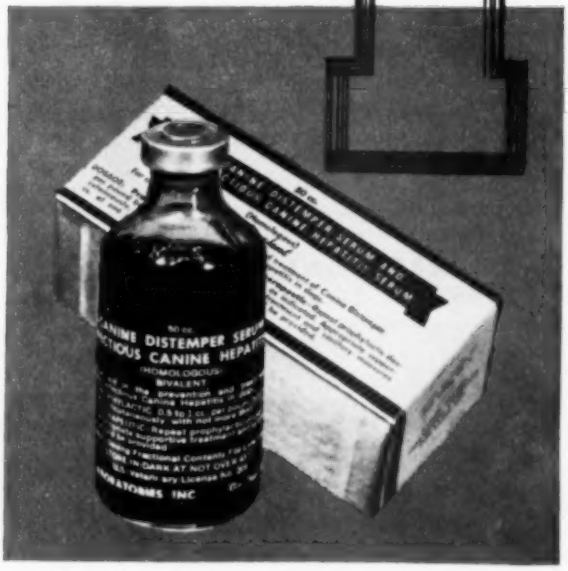
Veterinarian wanted for a modern Middlewest clinic. Facilities for 35 small animals, and any lab work desired, plus separate large animal hospital. Large animal work diversified with hogs, feeding cattle, and lambs plus grade-A milkshed dairies. Very discriminating clientele, well-versed, and de-

(Continued on p. 42)

ONE OF MANY FROMM FIRSTS

BIVALENT SERUM

FROMM was first to introduce a Bivalent canine distemper and anti-infectious hepatitis serum



FROMM
was first to pasteurize

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was first to filter

FROMM originated this effective two-way protection against hepatitis and distemper in dogs. PASTEURIZED — FILTERED — SAFE — this BIVALENT SERUM is your dependable protection to dogs against two serious diseases having almost identical early symptoms. Always inject FROMM BIVALENT SERUM whenever the symptoms of your dog patients indicate either distemper or infectious hepatitis. It provides a prompt and passive immunity in one injection.

FROMM
LABORATORIES, INC.
GRAFTON, WISCONSIN, U.S.A.

- *Sold only to Qualified Graduate Veterinarians*
- *Supplied in 50 CC. and 100 CC. vials*

CONTACT YOUR LOCAL INDEPENDENT DISTRIBUTOR

manding the best in service and diagnosis. Future depends strictly on the man. Address "Box L 12," c/o JOURNAL of the AVMA.

Prominent Eastern vitamin manufacturer has opening for a veterinarian for laboratory and clinical work. Interest in feed and nutritional problems, also routine clinical veterinary medicine. Send complete resume. Address "Box L 13," c/o JOURNAL of the AVMA.

Veterinarian wanted, experienced in small animal diagnosis and surgery. Excellent starting salary, bonus, opportunity to buy into practice. Present practice does an excellent gross. Splendid opportunity for the right man. Address "Box L 17," c/o JOURNAL of the AVMA.

Graduate veterinarian wanted for position as assistant director of veterinary virus research project. Laboratory experience necessary and some virology training desirable. Laboratory located in the East. Address "Box L 18," c/o JOURNAL of the AVMA.

Excellent opportunity for ambitious veterinarian capable of running hospital with 80% small animals. Salary, living quarters, and commission. Central East Texas. Gross $24,000. Address "Box L 20," c/o JOURNAL of the AVMA.

Veterinarian wanted to take over dairy practice in eastern United States. Address "Box L 21," c/o JOURNAL of the AVMA.

Assistant wanted in small animal hospital. Will pay good salary and give all opportunities to develop experience. Would be interested in individual for one or two years but would consider six months' time, if desired. Address, Barrett and Noonan, 490 East Cuyahoga Falls Ave., Akron 10, Ohio.

Wanted—Veterinarians

Veterinarian, middle age, good health, desires position with busy large or small animal practitioner, or as a meat inspector. Graduate of AVMA- and BAI-approved school. Address "Box L 3," c/o JOURNAL of the AVMA.

Very capable veterinarian, 36, wants position. Broad experience in small and large animals; two years of experience in United States. German graduated, good English, best of references. Excellent scientific background. Address "Box L 14," c/o JOURNAL of the AVMA.

Position wanted by European veterinarian, 45, graduated from an AVMA-recognized school. Address "Box L 19," c/o JOURNAL of the AVMA.

(*Continued on p. 44*)

AMAZING VALUE

NEW, Non-Hydraulic Veterinarian Examination Table

NOW AVAILABLE FOR IMMEDIATE DELIVERY

ORDER FROM YOUR SUPPLY HOUSE

STANDARD PORCELAIN TOP TABLE **$164.75**

(Prices Subject to Change Without Notice)

- Massive 20" circular base, heavily weighted, insures stability under all conditions.
- Base finished in lustrous, sanitary, black porcelain enamel that is easily kept clean.
- Gleaming white porcelain top is supported by 5" diameter triple-plated chromium column.
- Full size, 61 x 22", acid-resisting porcelain enamel top.

CONVENIENT — LOW-COST — CAN BE USED FOR OPERATIONS, TOO!

Again — Professional leads with the introduction of this big value, high-efficiency table that has many special features normally found only in de luxe equipment. Costly hydraulic mechanisms have been eliminated and the table top is at the most convenient working level, 37" from the floor.

Another desirable feature is the tilting mechanism that permits the top to be tilted up to 65 degrees at the foot end. This is a definite advantage toward better drainage and helps keep the working surface clean and sanitary.

The table top is equipped with all necessary accessories, including chrome-plated tie rods, polished aluminum adjustable ties and spring-steel rods. The operating surface is smooth and entirely free of sharp or rough edges.

PROFESSIONAL HYDRAULIC TABLE

One of the finest hydraulic tables ever offered — with the new, improved foot-pedal hydraulic mechanism. Leaves the hands free at all time for surgery. Top swivels and tilts to any desired position. Write your jobber or ask us for complete information.

PROFESSIONAL

Professional **MANUFACTURING COMPANY**

333 SOUTH PEORIA • CHICAGO 7, ILLINOIS

MANUFACTURERS OF SPECIALIZED PROFESSIONAL EQUIPMENT

(CLASSIFIED ADS—*continued from p. 42*)

Woman, graduate of approved school, small animal experience, seeks position in small animal or mixed practice leading to partnership or purchase. Address "Box L 4," c/o JOURNAL of the AVMA.

Middle-aged European veterinarian, approved school, looking for permanent employment in small animal practice. Do not want partnership, purchase, or own practice; would like to find a permanent home. Address "Box L 7," c/o JOURNAL of the AVMA.

Veterinarian wishes to obtain employment as assistant to veterinarian. Address Dr. Morgan Hannahs, Bk. 1, V.A. Center, Biloxi, Miss.

Remittance must accompany advertisement

Veterinarian, experienced, married, draft exempt, desires position with mixed or small animal practitioner leading to eventual partnership, or will lease with option to buy. Prefer Washington, D.C., or Southeast area. Address "Box L 22," c/o JOURNAL of the AVMA.

(*Continued on p. 46*)

Dr. Belloff Appointed Assistant to Medical Director, Eaton Laboratories

George B. Belloff, V.M.D., has been appointed assistant to the medical director of Eaton Laboratories, Inc., Norwich, N. Y., where he will supervise an extensive research program in problems of veterinary medicine under the direction of Dr. L. Eugene Daily. He succeeds Harold D. B. Roberts, D.V.M., who is departing on military leave.

Dr. Belloff was born in New Brunswick, N. J., in 1918 and recived his veterinary medical education at the School of Veterinary Medicine, University of Pennsylvania. Dr. Belloff is married and has two children. He saw war service in the Southwest Pacific, has held positions as associate pharmacologist and veterinarian in the pharmaceutical industry, and practiced at East Orange, N. J.

Dr. Belloff is a member of the American Veterinary Medical Association, the New Jersey State Veterinary Medical Association, and the New York Academy of Sciences.

(CLASSIFIED ADS—*continued from p. 44*)

Wanted—Practices

Want to purchase an established mixed or large animal practice in Pacific Northwest. Will consider lease with option to buy. Am a veteran with a family and a graduate of an accredited school. Have had several years of excellent experience in general practice, and now would like to settle down permanently. Your offer will be seriously considered. Address "Box J 18," c/o JOURNAL of the AVMA.

Lease, purchase, or partnership of small animal practice wanted by woman veterinarian, preferably west of Mississippi River. Address "Box L 5," c/o JOURNAL of the AVMA.

Practice wanted in Southwest, Texas, Oklahoma, Arkansas, or in Maryland. All correspondence confidential; replies guaranteed. Send complete information, including real estate value, equipment, competition, and annual gross. Address Munzy and Napp, Realtors, 601 West Side Ave., Jersey City, N.J.

Experienced practitioner desires to purchase established small animal hospital. Substantial cash available. Have a family. Licensed in Massachusetts, Connecticut, New York, Pennsylvania, Ohio. Address "Box L 15," c/o JOURNAL of the AVMA.

(*Continued on p. 48*)

Dr. Creamer Appointed Manager, Veterinary Department, Sharp & Dohme

Dr. Alan A. Creamer has been appointed manager of the veterinary department of Sharp & Dohme, Division of Merck & Co., Inc. Dr. Creamer replaces Dr. Bernard J. McGroarty who retired recently after thirty-five years with that company.

After attending the Cornell University School of Agriculture, Ithaca, N. Y., in 1939 and 1940, he entered the University of Pennsylvania undergraduate school, transferring to that university's School of Veterinary Medicine in 1942. From 1944 to 1946, he was with the Medical Detachment, U. S. Army, returning to the University of Pennsylvania to finish his education in 1946. He received his V.M.D. degree in 1948.

Dr. Creamer is a member of the Keystone Veterinary Association, the Pennsylvania State Veterinary Medical Association, and the American Veterinary Medical Association.

(CLASSIFIED ADS—*continued from p. 46*)

Graduate veterinarian from approved school, 1944, desires assistantship, partnership, or purchase practice. Serving in Air Force under doctor draft; available Feb. 1, 1954. Experienced in large and small animals. References; married, 31 years old. Licensed in Colorado, Oregon, Nebraska but will locate anywhere. Address "Box K 7," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Well-established, completely equipped veterinary hospital for sale with twenty-four outside boarding kennels. Located in one of the best counties in Oklahoma; 50% large animals, 50% small. Ideal for two men. Has small living quarters. Gross $26,000 in 1952. Price of $25,000 includes real estate, drugs, and equipment. Reason for selling, health. Address "Box K 16," c/o JOURNAL of the AVMA.

Well-established mixed practice located in progressive, friendly town in Midsouth, mild climate, city attractions within easy reach; modern, well-planned brick hospital, fully equipped. Will sell reasonably due to other interests; $5,000 down payment; balance on terms. Address "Box J 22," c/o JOURNAL of the AVMA.

Choice, modern, small animal hospital for sale. Fully equipped, well-established, lucrative practice in wealthy area southern California. Requires $25,000 down. Address "Box K 29," c/o JOURNAL of the AVMA.

(*Continued on p. 48*)

Correspondence

Vibrio Cultures Needed

July 16, 1953

Dear Editor:

I have been trying to obtain cultures of *Vibrio jejuni* and *Vibrio suis* for the past year with little success. The cultures are needed for some research work we have in progress.

Would it be possible for you to mention in the JOURNAL of the AVMA that we would be most pleased to receive cultures of either Vibrio species?

Your help will be appreciated.

Sincerely yours,

s/Erskine V. Morse, D.V.M.,
Department of Veterinary Science,
University of Wisconsin,
Madison 6, Wis.

(CLASSIFIED ADS—*continued from p. 47*)

Established mixed practice for sale located in progressive village near Rochester, N. Y. Predominantly a dairy cattle practice with a good share of small animals. Owner selling because of ill health. Address "Box E 30," c/o JOURNAL of the AVMA.

Excellent small animal practice for sale, Hollywood, Calif.; 50 cages, 18 outside runs, x-ray, drugs, and equipment. No real estate; good lease. Priced at less than one year's gross. Address "Box L 2," c/o JOURNAL of the AVMA.

Small animal hospital for lease, with option to buy. Modern masonry construction, fully equipped. Located in commercial district of large Middlewest city. Address "Box L 6," c/o JOURNAL of the AVMA.

New, modern animal hospital for sale or lease in excellent location in fast growing central California city. Could support two men for mixed practice. Owner wishes to retire. Address "Box L 8," c/o JOURNAL of the AVMA.

Established mixed practice for sale in nice West Texas city. A good income from both the practice and from city inspection work. Reason for sale, health. Address "Box L 9," c/o JOURNAL of the AVMA.

Small animal practice-hospital for sale or lease in Louisville, Ky. Attractive proposition for a man with limited funds. Applicants must be licensed in Kentucky. Address "Box L 10," c/o JOURNAL of the AVMA.

Pacific Northwest Opportunity—A going small animal practice for sale or lease by estate in Seattle. Annual gross since 1950 over $27,000; net over $16,000. Completely modern 70-kennel hospital includes stock, fixtures, equipment, and desirable living quarters. This plant is located in a growing business district and serves four major residential areas. Price $47,500; contract terms acceptable. Address Seattle-First National Bank, Trust and Estates Dept., Box 3347, Seattle 14, Wash.

Well-equipped small animal hospital for sale. Ideally located on busy U.S. highway; 100-ft. lot, 32 by 40 ft. block building, $12,600. Address Washington Realty Co., Washington, Ill.

(*Continued on p. 49*)

(CLASSIFIED ADS—*continued from p. 48*)

Small animal practice for sale in Chicago, including about $7,000 worth of all new equipment. Capable of grossing in excess of $30,000. Owner expects to be drafted soon; $5,000 down payment will handle. Excellent building, favorable lease; large modern apartment available. Address "Box H 3," c/o JOURNAL of the AVMA.

Almost new small animal hospital for sale. Completely equipped, 1,700 sq. ft., 35 kennels, outdoor runs, zoned in, apartment, beautiful booming town in San Diego County, Calif. Practice established eight years. $10,000 down; good terms. Address "Box L 16," c/o JOURNAL of the AVMA.

Mixed practice and concrete hospital for sale or lease. Large animal, 75%; small animal can be built up. Established 38 years. Address Dr. D. E. Sisk, Mansfield, Ill.

Mixed practice for sale or lease; office, apartment, 25 kennels, large animal building with distemper ward. On blacktop highway near Lansing, Mich.; $5,000 down to buy. Address "Box L 23," c/o JOURNAL of the AVMA.

Mixed practice for sale in Middlewest. Includes new home and adjacent office with facilities for small animals; 80% large animals, 20% small. Annual gross income, $15,000. Address "Box L 24," c/o JOURNAL of the AVMA.

Mixed practice for sale in Middlewest town of 7,000; one hour's drive from large city. $19,500 includes new house, containing office, drugs, equipment, two-way radio. Average net over $9,000 last four years. Address "Box L 25," c/o JOURNAL of the AVMA.

Small animal hospital and 6-room ranch house for sale near Chicago. Established practice with access to large animals. Selling below real estate value; $25,000. Retiring. Address "Box L 26," c/o JOURNAL of the AVMA.

Wanted to Buy

Wanted—old-type Hausman and Dunn equine emasculators with White's extra crushing attachment. Address "Box K 15," c/o JOURNAL of the AVMA.

Miscellaneous

For sale—one Silver King cattle chute, two-way radio equipment, instruments, and drugs. Complete information on request. Price, $2,000. Address "Box K 3," c/o JOURNAL of the AVMA.

For sale—Yashima YDS microscope, 5x, 8x, and 10x oculars; 10x, 40x, and 100x (oil immersion) objectives; mechanical stage; substage condenser. Excellent condition. Price $125. Address Dr. Walter S. Tyler, Veterinary Science, University of California, Davis, Calif.

Bovine Prolapse Preventer—Payton Utero-Vaginal Prolapse Preventer. Quickly, easily applied to any size cow. Positive protection. Re-usable, non-irritating, sanitary. Noninterference with placenta release. Excellent for vaginal protrusion; dispensing. See article JOURNAL of the AVMA, December, 1951. Only $3.00; two for $5.00; six for $12.00. Prepaid. Dr. Jerome Payton, Morris, N.Y.

(*Continued on p. 52*)

(CLASSIFIED ADS—*continued from p. 49*)

Received Too Late to Classify

Corporal

Rodolfo P. Hernandez, U.S. Army

Medal of Honor

0200 HOURS! Suddenly the pre-dawn blackness on Hill 420 split into crashing geysers of flame. Yelling, firing, hurling grenades, a horde of Reds pushed up the hill toward G Company.

A hot fire fight began, lasting several hours. Finally, suffering heavy casualties, G Company began to withdraw. Corporal Hernandez stayed, throwing grenades and firing his remaining rounds.

Then his M-1 jammed. Fixing his bayonet, he leaped out of his foxhole and disappeared in the darkness toward the attacking Reds. They found him in the morning, wounded, ringed with enemy dead. But he had stopped the attack—*alone*.

"A man couldn't fight at all," says Corporal Hernandez, "if he weren't fighting for good things—peace, and a job, and a chance in the world. That's why I'm thankful to the people who've put so many billions into Defense Bonds. For I believe Bonds are a stockpile of prosperity for our country. A guarantee to men like me that we can come home to a secure future."

Peace is for the strong!
For peace and prosperity save with
U. S. Defense Bonds!

Now E Bonds pay 3%! Now, improved Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semiannually when held to maturity. Also, all *maturing* E Bonds automatically *go on* earning—at the new rate—for 10 *more* years. Today, start investing in U. S. Series E Defense Bonds through the Payroll Savings Plan; you can sign up to save as little as $2.00 a payday if you wish.

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...making quite a ripple

the NEW H-G TABSULE

. . . characterized by its distinctive shape

This "junior sized" tabole — a tablet having an oblong capsule shape — facilitates administration of medication to young farm animals. It is easier to give a tabsule, especially in pathological conditions where swallowing a large round tablet may be difficult. The ever increasing line of H-G Tabsules contain the following formulas:

CU-NIC-KAM . . for removing stomach worms from ruminants.

SKOURSUL . . for treating of diarrhea in young farm animals.

STREPTOCIDE . . for streptococcic infections (60 gr.)

SULBEN . . for treating dysentery and enteric conditions. (60 gr.)

SULFA COMBINED . . for staph., strep., and pneumonic infections.

SULFAGUANIDINE . . for enteric infections of calves, lambs, and swine. (39 gr. and 78 gr.)

SULFAPYRIDINE . . for calf diphtheria, pneumonia, and foot rot. (60 gr.)

SULFATHIAZOLE . . for shipping fever. (60 gr.)

TANASUL . . for scours, enteritis, and intestinal catarrh in calves.

HAVER-GLOVER Laboratories
KANSAS CITY, MO.

1915 BROADWAY KANSAS CITY, MO.

SWINE ERYSIPELAS

This Could Be The Year —

The most favorable hog-corn ratio in the past few years for profit — and large numbers of unprotected swine — could lead to many late season outbreaks of swine erysipelas.

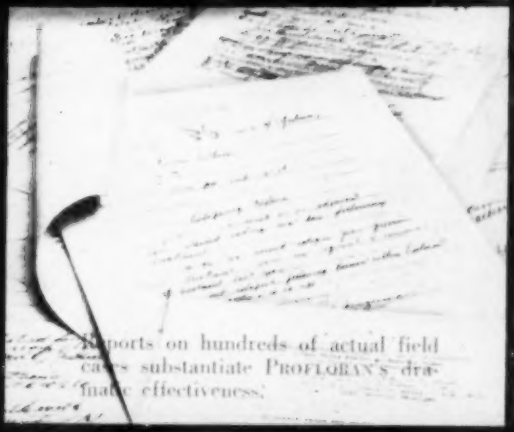
Lockhart has available adequate supplies of record-of-performance anti-sera for the control of this disease.

Look to Lockhart for swine erysipelas products with an unparalleled record of performance in the laboratory and in the field.

"Producers of Better Biologicals for Graduate Veterinarians."

ASHE LOCKHART, INC.

800 Woodswether Road **Kansas City, Missouri**



Reports on hundreds of actual field cases substantiate PROFLORAN's dramatic effectiveness.

New Profloran rapidly restores rumen flora to normal without fresh or dried contents transfusions!

Jen-Sal rumen media powder corrects rumen dysfunction by supplying specific cultural nutrients to the patient's own rumen flora

Jen-Sal has developed and field-tested a substratum formula which offers you a radically new and highly effective approach to the correction of rumen dysfunction.

We have named this new product PROFLORAN. And its principle is simple . . . but completely revolutionary.

Rather than transfusion of rumen contents from normal to sick animals, PROFLORAN provides a suitable culture media on which the patient's own rumen flora can multiply and attain normal levels.

PROFLORAN is supplied in 2 pound jars, boxes of 6. One jar, mixed with water and given by stomach tube or on the feed, has proved effective in even the most severe cases during extensive clinical testing.

In field cases ranging from impaction, chronic bloat, rumen atony, calf scours, anorexia, etc., PROFLORAN has proved dramatically effective . . . on calves as well as adult cattle.

JENSEN-SALSBERY LABORATORIES, INC.
KANSAS CITY, MISSOURI

Jen-Sal

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